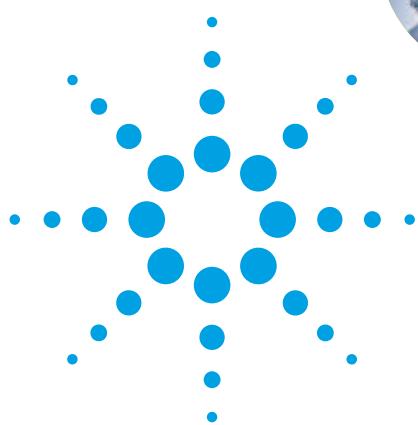


Operate your lab at peak performance  
Troubleshoot difficult problems  
Select the right Agilent supplies



## Maintaining Your Agilent 1100 Series HPLC System

Maximize efficiency. Minimize your downtime.  
**Get the results you need.**



Agilent Technologies



**We're committed to bringing you the world's best HPLC systems.**  
*Plus the critical information you need to keep them running properly.*

As an Agilent customer, you have complete access to over 40 years of industry knowledge and experience. With a wide range of technical know-how and a never-ending supply of ideas, our goal is to help you solve your most challenging application problems.

**That's why we created *Maintaining Your Agilent 1100 Series HPLC System*.**

It's designed to help you keep your HPLC system running at optimal performance, and to ensure that your manual injection valves, autosampler, pump, and detectors always work at peak efficiency.

Inside you'll find ...

- Essential facts about Agilent's 1100 Series HPLC consumables and accessories.
- Vital maintenance procedures and troubleshooting tips.
- All the Agilent part numbers you'll need in one easy-to-use guide.

So you'll expand your system's hours of continuous operation, decrease downtime, and get the *reproducible results* that your lab demands.

## Maintaining Your Agilent 1100 Series HPLC System

*Ensuring optimal performance and results.*

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### TIPS AND TOOLS

This icon denotes a helpful hint that provides useful information you can find throughout this guide and online at [www.agilent.com/chem](http://www.agilent.com/chem).

# Manual Injection Valves

*Meticulously engineered to ensure trouble-free operation.*

You can count on Agilent injection valves, just like you depend on your HPLC System.

That's because our valves are built to Agilent's industry-leading standards to ensure consistent results and optimum performance from your analytical instruments.

In this section, you'll find the latest in LC injection valve technology, along with part numbers and important maintenance information.



*"With more than 50,000 systems, the Agilent 1100 Series has become the industry's best-selling LC system. Agilent has earned its reputation for superior technology by designing and developing analytical instruments which produce consistent, first class LC results. Our wide range of columns, consumables and supplies are designed to the same level of quality to ensure day-in-day-out hassle free operation, keeping your productivity high and your operating cost low."*

**Erich Wagner**  
Product Manager



## CATALOG

For a complete selection of Injection Valves, see  
**Agilent's 2005-2006 Essential Chromatography Catalog.**  
Or visit our online catalog at [www.agilent.com/chem/6ecatalog](http://www.agilent.com/chem/6ecatalog).



**Agilent injection valves from Rheodyne are backed by 40 years of innovation and experience. They feature ...**

- **Patented Make-Before-Break (MBB) technology** that provides uninterrupted flow when switching between LOAD and INJECT positions. Additionally, MBB greatly reduces transient pressure shocks, which benefits flow-sensitive detectors, and extends column life.
- **Dual-mode (or front-loading) injection**, which enables either the partial-filling or the complete-filling of the sample loop.

- **An injection port built right into the handle.** This unique design allows the tip of the needle to connect directly to the sample loop. So you don't have to worry about sample loss during loading.

The reproducibility of manual sample injectors depends on operator skill, syringe precision, and loading method. The partial-filling method is typically reproducible to 1.0% relative standard deviation (RSD). The complete-filling method is reproducible to 0.1% RSD for 5  $\mu$ l loops.



### Series 7725i and 9725i Analytical Injection Valves

Stainless steel (SS) 7725i and PEEK 9725i valves are the most popular injection valves for analytical HPLC.

Features include:

- **A 20  $\mu$ l loop (installed).** Loops are also available in stainless steel or PEEK from 5  $\mu$ l to 5 ml (10 ml for PEEK).

- **Make-Before-Break (MBB) technology** allows switching without flow interruption.
- **Wide 30° port angles** offer easier access to fittings.
- **Built-in position sensing switch** provides the chromatograph with a reproducible start signal.

### Series 3725i-038 and 3725i Preparative Injection Valves

The series 3725i-038 (stainless steel) and 3725i (PEEK) are the most suitable manual valves for large sample volumes, high flow rates, and preparative columns sized 1.0-10 cm in diameter.

- **High reproducibility** for both partial-filling and complete-filling methods.
- **Sample range** is 100  $\mu$ l to 20 ml (10 ml loop is installed).
- **Flow range** is 10 to 800 ml/min.
- **Built-in position sensing switch** gives the chromatograph a reproducible start signal.
- **Versatile ports** accommodate 1/8" (3.2 mm) and 1/16" (1.6 mm) OD tubing. (Note: 1/16" OD tubing requires an adapter, PN 5067-1503.)
- **1.0 mm diameter passages** allow flow rates up to 800 ml/min with virtually no pressure drop.
- **Make-Before-Break technology** allows switching without flow interruption.



### Manual Injection Valves with Position Sensing Switches

Description	Part No.	Price (\$)
7725i, SS	5063-6502	976
9725i, PEEK	0101-1253	1121
3725i, SS, prep valve	0101-1232	1562
3725i, PEEK, prep valve	0101-1231	1428
Manual prep injection valve kit, SS (3725i-038) with position sensing, 10 ml loop, 25 ml syringe, ring mounting bracket, start cable, SS connecting capillaries, 0.5 mm id, 40 cm and 60 cm	5065-9922	1800

### RheBuild Kits

RheBuild kits include all individual parts (rotor seal, stator face assembly, isolation seal), tools, and instructions to completely refurbish specific valves to ensure high performance and long lifetime.

### RheBuild Kits Used with Rheodyne Series

Description	Part No.	Price (\$)
7725 Injection valve	0101-1254	181
7750-020 Injection valve (2-groove rotor seal)	0101-1257	283
7750-030 Switching valve (3-groove rotor seal)	0101-1258	283

## MANUAL INJECTION VALVES

### Maintenance and Replacement Parts for Manual Injection Valves

Description	Part No.	Price (\$)
<b>Rotor Seals</b>		
Vespel: operating pH 0 to 10 (7125, 7725)	0101-0623	97
Tefzel: operating pH 0 to 14 (7125, 7725)	0101-0620	97
PEEK: operating pH 0 to 14 (7125, 7725, 9725)	0101-1255	119
PEEK: operating pH 0 to 14 (3725)	0101-1233	125
<b>Stator Face Assembly</b>		
Rheodyne Series 7125	0101-0624	207
Rheodyne Series 7725	0100-1859	221
<b>Stators</b>		
Rheodyne Series 7725	0100-1860	466
<b>Accessories</b>		
Isolation Seal, Rheodyne Series 7725, 9725, 3725	1535-4046	27
Rheotool socket wrench 1/4 inch	8710-2391	26
Hex Key 9/64" 15cm long, T-handle	8710-2394	9
Ring stand mounting bracket	1400-3166	54
PEEK adapter, 1/8" to 1/16" (4/pk)	5067-1503	198
Position sensor switch for manual valves	0490-1849	81



#### Tips & Tools

Peak doubling can be a symptom that it is time to replace the injector rotor seal..

## Sample Loops

Stainless steel loop ends are square cut and burr-free for a flush connection to the valve. They are also supplied with unswaged fittings. Flexible PEEK loop ends feature a clean, straight cut for low dead-volume connection. Both types of sample loops are factory-cut and finished to the highest quality.



### Stainless Steel Sample Loops

**Remember ... size designations for loops are nominal.** The actual volumes can differ from their theoretical designations because of the  $\pm 0.025$  mm (0.001") tolerance of the metal tubing bore.

Generally, accuracy rates are about  $\pm 5\%$  for large metal loops (1.0 mm, 0.040"),  $\pm 10\%$  for intermediate loops (0.5 mm, 0.020"), and  $\pm 30\%$  for small loops (0.2 mm, 0.007"). However, since both standards and unknowns are typically analyzed using the same sample loop, knowledge of the actual volume is rarely needed. If you do need to know the sample volume, it is best to calibrate the loop while it is on the valve, so the valve's flow passage is also taken into account.

**Important:** Sample loops for the 7725 Series and 7125 Series are not interchangeable. That's because the port angle is 30° for the 7725, and 20° for the 7125.

### Stainless Steel Loops for 7125 and 7010 Injectors

Description	ID (mm)	Part No.	Price (\$)
5 $\mu$ l	0.18	1535-4860	83
10 $\mu$ l	0.30	0101-0376	42
20 $\mu$ l	0.51	0101-0377	37
50 $\mu$ l	0.51	0101-0378	41
100 $\mu$ l	0.51	0101-0379	42
200 $\mu$ l	0.76	0101-1252	45
500 $\mu$ l	0.76	0101-1251	51
1 ml	0.76	0101-1219	48
2 ml	1.00	0101-1250	87
5 ml	1.00	0101-1249	149

### Stainless Steel Loops for 7725 Injectors

Description	ID (mm)	Part No.	Price (\$)
5 $\mu$ l	0.18	0101-1248	44
10 $\mu$ l	0.30	0100-1923	41
20 $\mu$ l	0.30	0100-1922	37
50 $\mu$ l	0.51	0100-1924	41
200 $\mu$ l	0.76	0101-1247	45
500 $\mu$ l	0.76	0101-1246	51
1 ml	0.76	0101-1245	57
2 ml	1.00	0101-1244	87
5 ml	1.00	0101-1243	149

## MANUAL INJECTION VALVES



### PEEK Sample Loops for 9725 Injectors

Description	ID (mm)	Part No.	Price (\$)
5 µl	0.18	0101-1241	32
10 µl	0.25	0101-1240	35
20 µl	0.25	0101-1239	35
50 µl	0.51	0101-1238	35
100 µl	0.51	0101-1242	37
200 µl	0.51	0101-1237	53
500 µl	0.76	0101-1236	55
1 ml	0.76	0101-1235	73
2 ml	0.76	0101-1234	103
5 ml	0.76	0101-1230	187

### PEEK Sample Loops

PEEK is inert to almost all organic solvents and is biocompatible. Like metal loops, the actual volumes of PEEK loops can differ from their nominal designations because of the  $\pm 0.05$  mm (0.002") tolerance of the tubing bore. Generally, accuracy rates are about  $\pm 14\%$  for large PEEK loops (0.8 mm, 0.030"),  $\pm 21\%$  for intermediate loops (0.5 mm, 0.020"), and  $\pm 65\%$  for small loops (0.2 mm, 0.007").

Although PEEK is compatible with virtually all solvents, many factors can affect the burst pressure of PEEK tubing. For example, wall thickness, temperature, exposure time and concentration of organic solvents can all impact durability. Additionally, solvents such as THF, methylene chloride and DMSO cause PEEK to swell – while concentrated nitric acid and sulfuric acid can weaken PEEK tubing.

### PEEK Sample Loops for 3725 Injectors

Description	ID (mm)	Part No.	Price (\$)
2 ml	1.6	0101-1229	105
5 ml	1.6	0101-1228	175
10 ml	2.0	0101-1227	184
20 ml	2.0	0101-1226	252

# Autosampler Maintenance

*Ensuring peak performance and increasing your lab's uptime.*

Routine maintenance of your Autosampler should include the following tasks:

- Replacing the rotor seal
- Checking the stator
- Replacing the needle and needle seat
- Checking the finger caps
- Replacing the metering unit seal
- Cleaning the piston
- Cleaning the solvent waste path
- Checking the leak sensor
- Performing a pressure test

This section will give you step-by-step instructions on how to perform many of these procedures.

You'll also find the top-quality Agilent consumables and accessories you need to keep your Autosampler running at top efficiency.



*"First we ask customers what they would like to accomplish. Then we recommend the best products for their needs, and explain how to use them."*

*"People come to Agilent because they know they'll get intelligent information that will help them be more productive. How do I know? I was once an Agilent customer."*

**Maureen Joseph**  
Analytical Chemistry Applications Chemist



## CATALOG

For a complete selection of Injection Valves, see  
**Agilent's 2005-2006 Essential Chromatography Catalog.**  
Or visit our online catalog at [www.agilent.com/chem/6ecatalog](http://www.agilent.com/chem/6ecatalog).

## Injection Valve Maintenance

**Rotor seal replacement** is the most common injection valve maintenance procedure. Indications include rotor seal blockages and cross-port leaks. You should suspect a cross-port leak if you notice a drop of mobile phase coming out of the needle when it rises to draw sample from a vial. Or, if you experience poor injection volume precision. Cross-port leaks can also be found by performing a pressure test.

### Tools

9/64" Allen wrench (to remove the stator face and disassemble the valve)

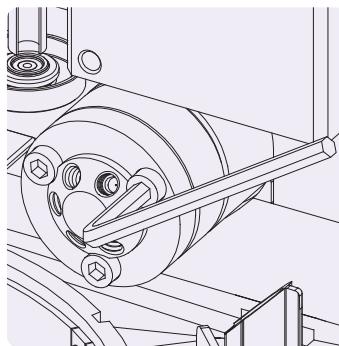
Metric hexagonal keys (for the rest of the Autosampler screws)

1/4" Wrench (to remove the capillaries)

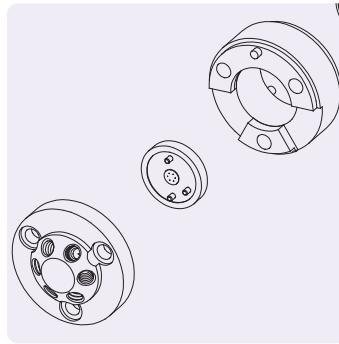
### Replacing the Rotor Seal

*For Standard and Well Plate Autosamplers  
G1313A, G1327A, G1367A*

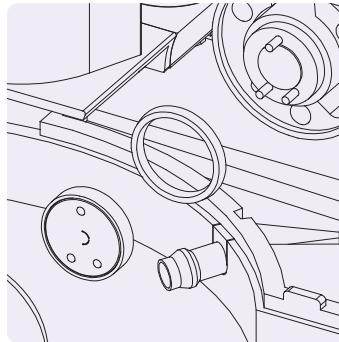
1. Remove the capillaries from the stator face. Remove the stator screws with a 9/64" Allen wrench.



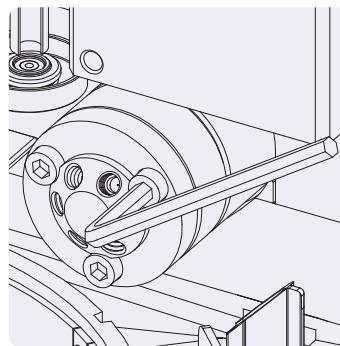
2. Remove the stator head, stator face, and stator ring.



3. Remove and replace the rotor seal (and the isolation seal, if necessary).

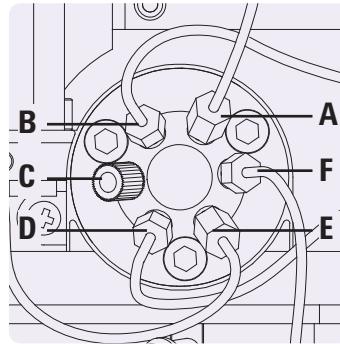


4. Install the stator head, then the stator face. Replace the stator screws, tightening them evenly and carefully.



5. Connect all capillaries according to the diagram below.

A - Pump  
B - Metering device  
C - Plug  
D - Waste  
E - Needle seat  
F - Column



**Injection Valve Maintenance**

Used In (Instrument)	Description	Part No.	Price (\$)	RheBuild Kit Part No.	Price (\$)	Rotor Seal Part No.	Price (\$)	Stator Part No.	Price (\$)
G1313A, G1329A, G1367A	2 Pos/6 Port Injection Valve	0101-0921	1102	0101-1257	283	0100-1853 (Vespel)	90	0100-1850 Stator head	336
						0100-1849 (Tefzel)	89		
						0100-2231 (PEEK)	137	0100-1851 Stator face	188
G1377A	2 Position/6 Port μ Injection Valve	0101-1050	1453	0101-1257	283	0100-2088 (Vespel)	158	0100-2089	755
G2258A	10 Port, Dual Loop Valve	0101-1385	1589			0100-2415	157	0101-1390	718
G2260A	2 Position/6 Port MBB Injection Valve	0101-1267	1565	0101-1268	313				

**Exchanging the Needle/Needle Seat for the G1313A,  
G1329A, G1389A and G2260A****(See manual for G1367A and G1377A)**

The needle should be replaced when it becomes bent, burred or blunt. The needle seat should be replaced when it is leaking or plugged. You should suspect a leak if you notice a trail of buffer crystals on the needle seat. The needle seat can become blocked if the sample contains particulates, as this is the first restriction that the sample experiences. If this occurs, try backflushing the needle seat capillary.

**Exchanging the Needle**

Before beginning this procedure:

- Select "Change Needle" under "Maintenance Function."
- Remove the front cover when the needle is positioned approximately 15 mm over the needle seat.

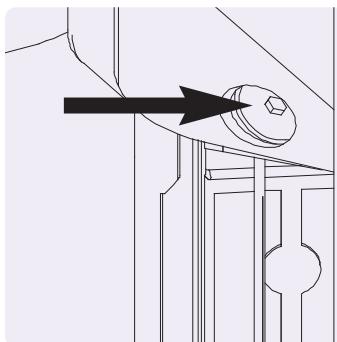
**Tools**

1/4" Wrench

2.5 mm Hexagonal key

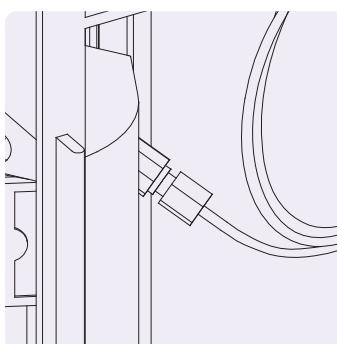
When installing the new needle, take care not to strip the setscrew. You may have to bend the needle slightly to ensure needle seat alignment.

1. Select "Needle Down" button until the needle screw shows up in the hole of the safety cover.



2. Remove the sample loop.

Loosen and remove the needle's set screw.

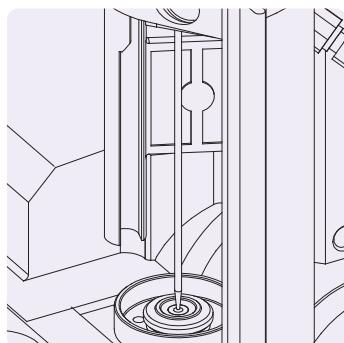


3. Move the needle arm to the lowest point using the "Needle Down" function.

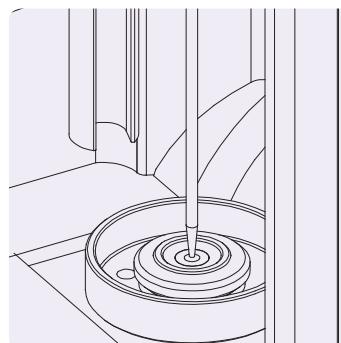
Install the new needle.

Align the needle above the needle seat.

Reconnect the sample loop.



4. Situate the needle approximately 2 mm above the seat using the "Needle Up" function. Ensure the needle is aligned with the seat.



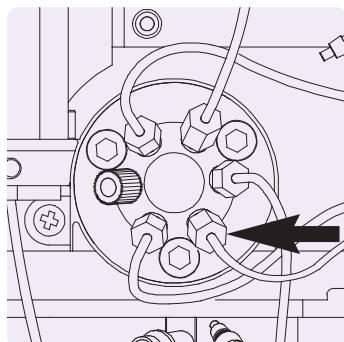
### Exchanging the Needle Seat

(See manual for well-plate Autosampler)

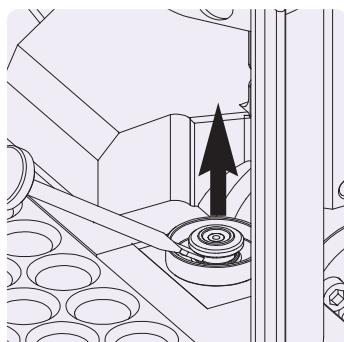
Before beginning this procedure:

- Select "Change Needle" under "Maintenance Function."
- Remove the front cover when the needle is positioned approximately 15 mm over the needle seat.

1. Disconnect the seat capillary from the injection valve (port 5).



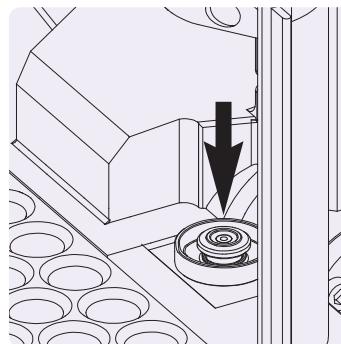
2. Use a small, flat screwdriver to ease out the needle seat.



3. Insert the new needle-seat assembly.

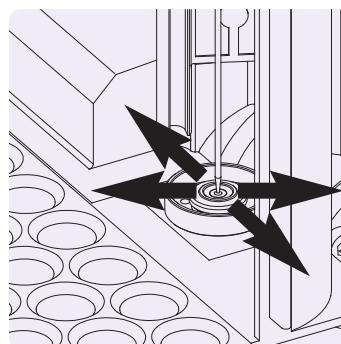
Press the seat firmly into position.

Connect the seat-capillary fitting to port 5 of the injection valve.



4. Use the "Needle Down" button to position the needle above the seat, making sure the needle and seat are properly aligned.

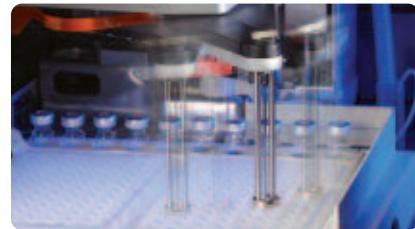
Install the front cover and select "END" under "Maintenance Function."



Agilent Autosampler	Needle Assembly Description	Part No.	Price (\$)	Compatible with Needle Seat	Part No.	Price (\$)
G1313A, G1327A, G1329A	Needle assembly, standard autosampler	G1313-87201	56	Standard needle seat 0.17 mm ID capillary, 2.3 $\mu$ l	G1313-87101	88
				Standard needle seat 0.12 mm ID capillary, 1.2 $\mu$ l	G1313-87103	89
G1313A, G1327A, G1329A	Needle assembly, for use with PEEK seat	G1313-87203	133	Standard needle seat, PEEK 0.17 mm ID capillary, 2.3 $\mu$ l	G1313-87102	187
G1313A, G1327A, G1329A	Needle assembly, 900 $\mu$ l upgrade	G1313-87202	104	Standard needle seat 0.17mm ID capillary, 2.3 $\mu$ l	G1313-87101	88
G1387A, G1389A	Needle assembly, $\mu$ -LC autosampler	G1329-80001	56	$\mu$ -LC Needle seat 100 $\mu$ m ID capillary, 1.2 $\mu$ l	G1329-87101	187
				$\mu$ -LC Needle seat 50 $\mu$ m ID capillary, 0.3 $\mu$ l	G1329-87103	187
G1367A	Needle assembly, well plate autosampler (green)	G1367-87200	101	Needle seat, well plate autosampler 0.17 mm ID capillary, 2.3 $\mu$ l	G1367-87101	101
	Needle assembly, well plate autosampler (new, blue)	G1367-87201	190	Needle seat, well plate autosampler 0.12 mm ID capillary, 1.2 $\mu$ l	G1367-87102	103
G1377A	Needle assembly, $\mu$ -well plate sampler	G1377-87201	190	Needle seat, $\mu$ -well plate autosampler (without seat capillary)	G1377-87101	187
				Seat Capillary 100 $\mu$ m, 150 mm Fused silica/PEEK with fittings	G1375-87317	67
				Seat Capillary 75 $\mu$ m, 150 mm Fused silica/PEEK with fittings	G1375-87316	67
				Seat Capillary 50 $\mu$ m, 150 mm	G1375-87300	67
G2258A	Needle assembly, dual loop autosampler	G2258-68710	342	Twin needle seat, dual loop autosampler	G2258-87102	288
G2260A	Needle assembly, prep autosampler	G2260-87201	104	Needle seat, prep autosampler 0.5 mm ID, 20 $\mu$ l	G2260-87101	101

## Autosampler Parts and Supplies

Agilent offers a variety of supplies that increase the flexibility of your 1100 System.



### Trays for 1100 Series Autosamplers

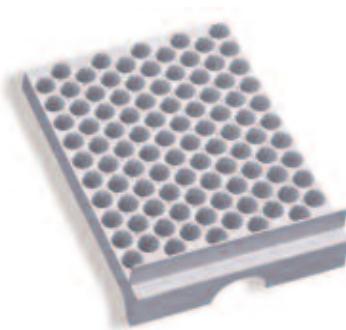
Description	Used In (instrument)	Part No.	Price (\$)
Tray for 100 2 ml vials	G1313A G1367A G1377A	G1313-44500	29
Tray for 40 2 ml vials	G1313A	G1313-44502	25
Tray for 15 6 ml vials	G1313A G1329A G1389A G2260A	G1313-44503	25
Tray for 100 2 ml vials, thermostattable	G1329A G1389A G1367A G1377A G2260A	G1329-60001	108
Tray for 2 well plates, 10 2 ml vials	G1367A G1377A	G1367-60001	94

### G1313/27A 1100 Series Autosampler Kits

Description	Part No.	Price (\$)
Maintenance kit Includes 1 rotor seal (Vespel), 1 needle, 1 needle seat, 2 metering seals, 15 fingercaps	G1313-68709	293
Accessory kit Includes 3 hex keys, 2 wrenches, tubing, 1 label halftray, wrist strap, 15 fingercaps, 0.17 id x 180 mm capillary, 100 screw top 2ml vials and caps, tray for 40 2 ml vials, tray for 15 6 ml vials	G1313-68705	122
Preventative maintenance kit Includes 1 each: rotor seal, isolation seal, stator face, needle, needle seat	5065-4498	407

**G1313/27/29A 1100 Series Autosampler Supplies**

Description	Part No.	Price (\$)
External Vial Tray for 17 vials (disposal position)	G1313-60004	232
Disposal Tube for external vial tray	G1313-27302	42
Waste tubing, 5 m, 6.5 mm ID, corrugated polypropylene	5062-2463	23
Needle seat PEEK, 0.17 mm ID capillary, for standard autosampler, 2.3 $\mu$ l	G1313-87102	187
Needle assembly for use with PEEK seat	G1313-87203	133
Needle arm kit	G1313-68713	28
Finger Caps, 15/pk	5063-6506	14

**G1387A 1100 Series Micro Autosampler**

Description	Part No.	Price (\$)
Capillary sampler accessories kit	G1329-68715	283
Injection valve for 1100 $\mu$ -LC System	0101-1050	1453
Rotor seal, Vespel, 2-grooves for $\mu$ -LC	0100-2088	158
Stator for $\mu$ -LC valves, special hardened	0100-2089	755
6 fittings, 2 plugs, PEEK for $\mu$ -valves	5065-4410	157
Piston seal, 2 mm	5022-2175	59
Seal support assembly	G1377-60002	102
Seat assembly, 100 $\mu$ m ID, 1.2 $\mu$ l	G1329-87101	187
Seat assembly, 50 $\mu$ m ID, 0.3 $\mu$ l	G1329-87103	187
Needle assembly for $\mu$ -LC autosampler	G1329-80001	56
Waste tube, FEP, 1.6 mm OD, 0.8 mm ID	G1375-87326	28

**Tips & Tools**

Keep an extra needle seat capillary assembly on hand. This unique part may be ordered through your Agilent representative.

**G1367A 1100 Series Well Plate Autosampler**

Description	Part No.	Price (\$)
Well plate sampler accessories kit Standard ship kit, includes 100/pk 2 ml screw top vials & caps, 10/pk 0.5 ml 96 well plates, tools, 380 mm 0.17 mm capillary, CAN cable	G1367-68705	278
Needle assembly, well plate autosampler (green)	G1367-87200	101
Needle assembly, well plate autosampler (new, for SN greater than DE21001534)	G1367-87201	190
Seat assembly, 0.17 mm ID, 2.3 $\mu$ l	G1367-87101	101
Seat assembly, 0.12 mm ID, 1.2 $\mu$ l	G1367-87102	103
Loop capillary, 100 $\mu$ l	G1367-87300	228
Peristaltic pump	5065-4445	36
Tray for 2 well plates, 10 2 ml vials	G1367-60001	94

**G1377A 1100 Series Micro Well Plate Autosampler**

Description	Part No.	Price (\$)
Micro well plate sampler accessories kit Standard ship kit, includes 100/pk 2 ml screw top vials & caps, 10/pk 0.5 ml 96 well plates, tools, 40 $\mu$ l loop, 50 cm 50 $\mu$ m fused silica/PEEK capillary, 75 $\mu$ m seat capillary, CAN cable	G1377-68705	726
Seat Capillary, 50 $\mu$ m, 150 mm, Fused silica/PEEK with fittings	G1375-87300	67
Seat Capillary, 100 $\mu$ m, 150 mm, Fused silica/PEEK with fittings	G1375-87317	67
Seat Capillary, 75 $\mu$ m, 150 mm, Fused silica/PEEK with fittings	G1375-87316	67
Loop capillary, 8 $\mu$ l	G1375-87315	100
Loop capillary, 40 $\mu$ l	G1377-87300	170
SS capillary, 0.25 mm ID, 12 cm	G1377-87301	52
Tool for Micro seal capillary mounting	G1377-44900	21

**Product Finder**

For information on Agilent's well plates and supplies see page 18.

# Fraction Collectors

*Reliable, rugged and easy to use.*

Agilent 1100 Series fraction collectors are designed to meet stringent standards for collection capability. So you never have to compromise on recovery and purity.

In this section, you'll find essential facts about our analytical scale (AS) and preparative scale (PS) fraction collectors – including:

- Fraction collector maintenance – plus simple repairs you can perform without a service call.
- Agilent-engineered parts – such as trays, collecting tubes, plates and needle assemblies.
- Guidelines for maintaining the micro fraction collector/spotter.
- MALDI spotting accessories.
- Part numbers, ordering information and much more.

You can also visit [www.agilent.com/chem](http://www.agilent.com/chem) for more details about fraction collection performance, software solutions and application guidelines.



*"We manufacture our HPLC systems from the ground up – and provide our customers with a wide variety of columns, consumables, and supplies built to Agilent's precise specifications.*

*"We're also a great resource for all types of applications ... in fact, we're developing new ones every day. You might say that we're your partner in chromatography."*

**Ron Majors**  
**Product Marketing Specialist**



## CATALOG

For a complete selection of Injection Valves, see  
**Agilent's 2005-2006 Essential Chromatography Catalog.**  
Or visit our online catalog at [www.agilent.com/chem/6ecatalog](http://www.agilent.com/chem/6ecatalog).

## Analytical and Preparative Fraction Collector Maintenance

Fraction collectors/spotters are very user friendly, and do not require much maintenance. However, you *should* perform the following routine procedures:

- Exchange the tubing at least once per year.
- Replace the capillaries.
- Replace the flap septum.



### Simple Repairs

#### Tubing Replacement

There are two types of tubing available to connect the valve with the needle: **preparative scale PTFE tubing** (0.8 mm id) and **analytical scale tubing** (0.25 mm id). Both types should be replaced when they become contaminated, worn or damaged.

Before replacing the tubing, be sure to ...

1. Position the fraction collector's transport unit in the "Home" position.
2. Remove all installed trays from the tray base.
3. Position the transport unit in the "Change Parts" position.
4. Turn off the instrument.

Consult your user's manual for detailed replacement instructions.

Procedure	When to Perform
Replace the inlet/waste tubing	Once per year -- or when you notice signs of damage or wear
Replace the valve-to-needle tubing	Once per year -- or when you notice signs of damage or wear
Exchange the <i>preparative</i> needle assembly	When the needle shows signs of damage or blockage
Exchange the <i>analytical</i> needle assembly	When the needle shows signs of damage or blockage -or- when using the short needle assembly with high test tubes (>45 mm)
Exchange the diverter valve	When the valve is leaking or not switching properly
Exchange the internal tray	When the flow delay sensor no longer works
Repair or exchange a funnel within the internal tray or funnel tray	When defective, leaky, blocked or contaminated



### Trays, collecting tubes and plates for 1100 Series Fraction Collectors

Agilent offers a broad range of trays, glass collecting tubes and well plates. When deciding what's best for your application, consider the size and number of the fractions you want to collect.

#### Trays and Collecting Tubes

Hole Diameter (mm)	No. of Tubes	Dimensions	Tray Part No.	Price (\$)	Tube Part No.	Unit	Price (\$)
30	40	30 x 100 mm	G1364-84503	261	5042-6458	100/pk	41
		30 x 48 mm			5042-6470	100/pk	40
25	60	25 x 100 mm	G1364-84504	261	5042-6459	100/pk	34
16	126	16 x 100 mm	G1364-84505	261	5022-6532	250/pk	33
		16 x 48 mm			5022-6533	100/pk	12
12	215	12 x 100 mm	G1364-84506	261	5022-6531	250/pk	23
		12 x 48 mm			5022-6534	100/pk	11

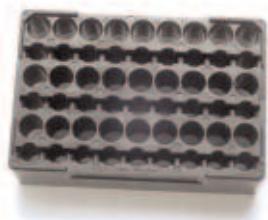
#### Well plate trays

Description	Part No.	Price (\$)
Tray for 4 well plates, cooled	G1364-84501	126
Tray for 2 well plates, 10 funnels, cooled	G1364-84502	455
Tray for 2 well plates, 10 2 ml vials	G1367-60001	94

## Well plates



G2255-68700



5022-6538

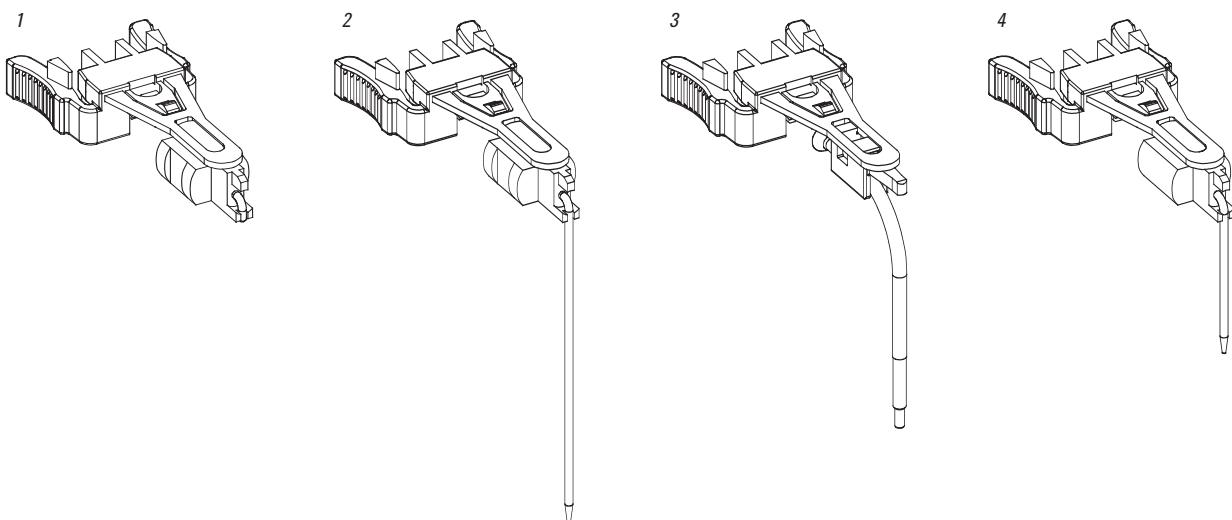


5022-6539

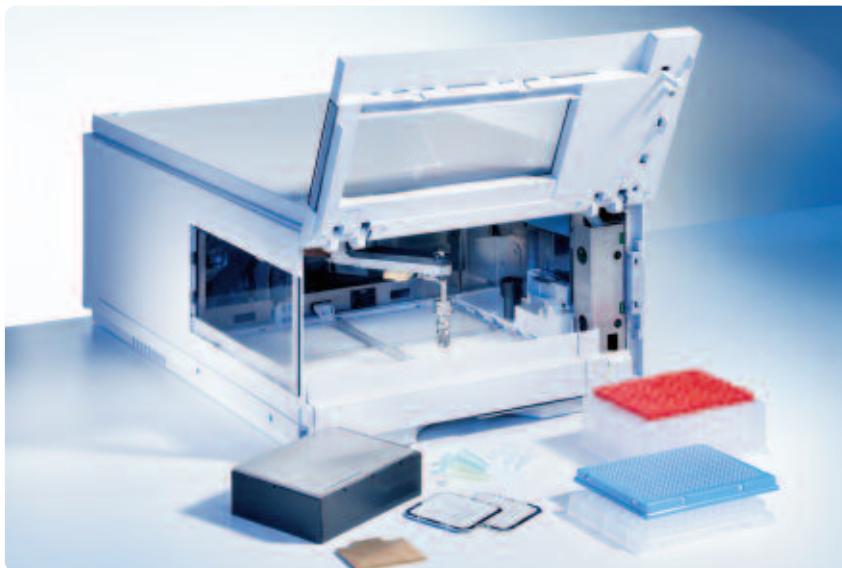
Description	Unit	Part No.	Price (\$)
96 Well plates, 0.5 ml, Polypropylene	120/pk	5042-1385	195
96 Well plates, 0.5 ml, Polypropylene	10/pk	5042-1386	22
96 Deep well plates, 1.0 ml, Polypropylene	50/pk	5042-6454	372
Closing mats for 96 well plates, silicone	50/pk	5042-1389	217
384 well plates, Polypropylene	30/pk	5042-1388	195
Glass inserts, 350 $\mu$ l	1000/pk	5188-5321	184
Caps/septa for glass inserts	1000/pk	5188-5322	517
96 Well Plates, 150 $\mu$ l, conical	25/pk	5042-8502	185
96 Deep well plate with glass inserts, caps/septa		5065-4402	86
Vial plate for 54 x 2 ml vials	6/pk	G2255-68700	184
Tray for 27 Eppendorf safe lock tubes, 0.5/1.5/2 ml		5022-6538	83
Vial plate for 15 x 6 ml vials		5022-6539	83

## Needle Assembly Description

Item	Description	Part No.	Price (\$)
1	Needle assembly preparative scale	G1364-87201	80
2	Needle assembly analytical scale (20 mm)	G1364-87202	262
3	Needle assembly analytical scale (50 mm)	G1367-87200	101
4	Capillary guiding assembly micro scale	G1364-87303	479



## Maintaining The Micro Fraction Collector/Spotter



### Simple Repairs

Procedure	When to Perform
Replace fraction collector capillary	At least every six months or when worn, blocked or damaged
Exchange the capillary guiding assembly	When bent or damaged
Exchange the internal tray	When the flow delay sensor no longer works properly
Exchange the flap septum and waste tubing	At least every six months or when defective or contaminated

Agilent offers three types of connecting capillaries – each with different internal diameters. We recommend replacing the capillaries and flap septum every six months – or when contaminated, blocked, worn, or visibly damaged.

Before replacing the capillary, be sure to ...

1. Place the transport unit of the micro fraction collector/spotter in the "Home" position.
2. Remove all installed trays from the tray base.
3. Place the transport unit in the "Change Parts" position.
4. Turn off the instrument.
5. Unscrew the micro fraction/spotter capillary from the flow cell of the detector.

**G1364D Micro Fraction Collector**

Description	Part No.	Price (\$)
MALDI spotting adapter for G1364D	G1364-83205	107
Pushing adapter assembly for G1364D	G1364-60021	124
Flap septum, PEEK, for internal tray	G1364-27107	45
Fused silica/PEEK capillary, 25 $\mu$ m, 50 cm	G1364-87304	118
Fused silica/PEEK capillary, 50 $\mu$ m, 50 cm	G1364-87305	121
Fused silica/PEEK capillary, 100 $\mu$ m, 50 cm	G1364-87306	104
Waste tube, PTFE, 20 cm 1.4 mm ID 2.0 mm od	G1364-86711	22
MALDI plate carrier Bruker	5022-6541	206
MALDI plate carrier ABI	5022-6542	134
MALDI plate carrier Agilent	5022-6543	134
MALDI plate carrier Micromass	5022-6544	134
Target Plate for AP-MALDI LC/MS	G1972-60025	215
Calibration Plate Bruker	5023-0208	175
Calibration Plate ABI 10x10 & 20x20	5023-0213	124
Calibration Plate Agilent	5023-0214	175
Calibration Plate Micromass	5023-0215	175
On-line matrix Kit for MALDI spotting Includes BCD board/cable, syringe, needles, adapters, connector, capillary	G1364-68706	803



G1364-83205



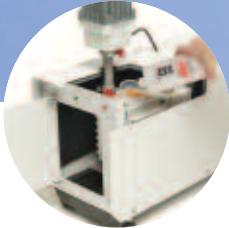
G1364-60021



5022-6541



5023-0208



## Now there's a cleaner, smarter way to maintain your LC/MS rough pump.

### *Introducing ... the Agilent Quiet Cover!*

Nobody likes changing the oil in an LC/MS rough pump. It's a heavy, dirty job – from lifting the pump out of its pan, to holding the pump steady while the oil drains.

But with the Agilent Quiet Cover, there's no sweating, straining or spilling.

**Need to check the oil?** Just open the Quiet Cover's door.

**Need to add oil?** Simply lift the Quiet Cover's top to access the fill cap.

**Need to change the oil?** Just slide out the drainage tray.

What's more, the Quiet Cover fits over your rough pump in seconds, and features...

- **A sound-absorbing cabinet with mounting grommets** to reduce noise and vibration.
- **Two internal fans** to prevent overheating.
- **A built-in alarm system** that warns you if the temperature exceeds 35°C.

So order your Quiet Cover today – and discover a cleaner, *smarter* way to keep your pump running at peak efficiency. (Part # G3199A).

**Call 1-800-227-9770**, option 1 (U.S. and Canada), or  
**Visit [www.agilent.com/chem/1quietcover](http://www.agilent.com/chem/1quietcover)**



# Pump Maintenance

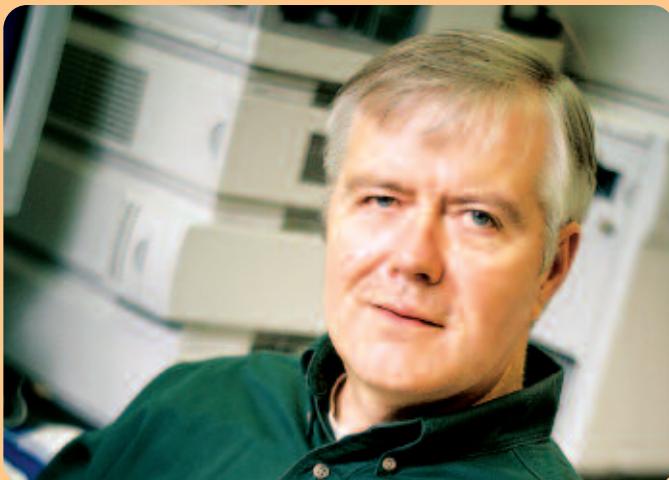
*Achieve maximum uptime by following our recommended procedures.*

The Agilent 1100 Series HPLC system has several different pump units to choose from: isocratic, binary, quaternary, capillary and preparative. Additionally, you can access all pump parts by simply removing the front cover.

In this section, you'll find step-by-step instructions for the following routine maintenance procedures – along with part numbers and ordering information to help you save time:

- Replacing the PTFE frit
- Cleaning the outlet ball valve
- Replacing the AIV cartridge
- Replacing the seals and pistons
- Cleaning or replacing the solvent inlet filters

You may perform these procedures all at once, or as needed. Keep in mind, though, that some parts may need replacing more often than others, depending upon your application and solvent preparation procedures.



*"Helping our customers meet their challenges requires an understanding of their needs – as well as the technical aspects of their work. Ultimately, I know that my answers and suggestions will directly affect our customers' success."*

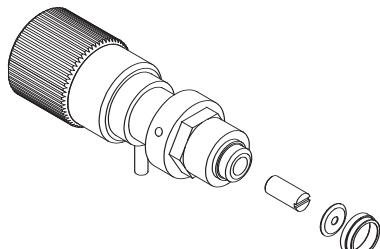
**John R. Palmer**  
**Chromatography Specialist**

## CATALOG



For a complete selection of Injection Valves, see  
**Agilent's 2005-2006 Essential Chromatography Catalog.**  
Or visit our online catalog at [www.agilent.com/chem/6ecatalog](http://www.agilent.com/chem/6ecatalog).

## Purge Valve – Exchanging the PTFE Frit 1100 standard pump modules



Purge valves feature a gold seal held in place with a plastic cap. Small leaks can occur here, so you will need to replace the gold seal after the valves have been removed more than once or twice.

When replacing the frit, make sure that the cutout side faces up, which provides more surface area on the side facing the solvent flow.

1. Remove capillary and waste tube.
2. Use a 14 mm wrench to unscrew the valve.
3. Remove the plastic cap and the gold seal.
4. Use tweezers to remove the old frit and install a new frit.
5. Replace the gold seal and the plastic cap.
6. Install the valve.

### Pump Maintenance Parts

Description	Part No.	Price (\$)
1100 Pump Start Up Kit includes: 1 outlet cap, 2 PTFE frits, 4 piston seals, 1 outlet gold seal, 2 inlet filters, 1 cartridge for active inlet valve.	G1311-68710	444
PTFE Frits 5PK	01018-22707	26
Gold seal, outlet	5001-3707	25
Outlet caps, 4/PK	5062-2485	22
Purge valve assembly, SS For 1100 and 1050 pumps	G1311-60009	351



### Maintenance Minder

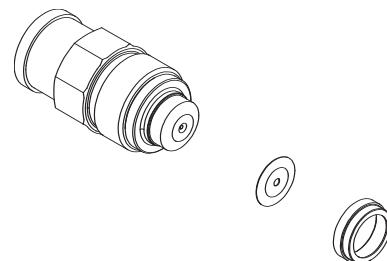
Realign the purge valve waste tube in the correct orientation during installation.

## Cleaning or Exchanging the Outlet Ball Valve

1. Remove the capillary from the valve.
2. Use a 14 mm wrench to remove the valve.
3. Remove the plastic cap and gold seal.
4. Clean the ball valve in an ultrasonic bath and replace. (Or, replace with a new valve).
5. Replace the gold seal and cap.
6. Use a 14 mm wrench to reinstall the valve.

You should change the outlet ball valve as part of your regular maintenance routine – or when the valve is leaking internally. Typically, if the pressure ripple is unstable, you should run a leak test to determine if the outlet ball valve needs to be replaced.

Description	Unit	Part No.	Price (\$)
Outlet ball valve, (quaternary, isocratic)		G1311-60012	268
Outlet ball valve (binary)		G1312-60012	301
Gold seal		5001-3707	25
Outlet caps	4/pk	5062-2485	22
Binary pump outlet valve SS sieve	10/pk	5063-6505	14



### Tips & Tools



The outlet ball valve of the binary pump has an additional sieve (5063-6505).

## Replacing the Active Inlet Valve cartridge

(All pumps except the G1361A preparative pump)

You should service the active inlet valve when the pressure ripple is unstable and a leak test confirms a problem with the valve due to internal leaking. The active inlet valve contains a cartridge that you can exchange as follows:

1. Use a 14 mm wrench to remove the active inlet valve.
2. Change the cartridge.
3. Reinstall the active inlet valve.

Description	Part No.	Price (\$)
Cartridge for active inlet valve	5062-8562	164
Active Inlet Valve for 1100	G1312-60010	447

## Pistons and Seals

*Step up to the strength and consistency of sapphire pistons.*

Agilent pistons are made from a high purity, monocrystalline sapphire for maximum durability. Although ceramic pistons can be manufactured at a lower cost, ceramic is a sintered, polycrystalline material, which can cause undesired variations during the production process.

Agilent sapphire pistons ...

- **Are meticulously cut at just the right angle**, making them the most durable – and longest lasting – pistons in the world.
- **Are precisely aligned in their stainless steel holder** to minimize wear on the piston and seal.

Agilent seals are designed to fit snugly around our pistons, and are capable of adapting to a wide range of flow rates and pressures.

Agilent piston seals ...

- **Are spring-loaded and engineered to deliver optimal performance** over highly dynamic flow and pressure ranges.
- **Are manufactured from a proprietary polymer blend**, and feature a spring made from the same high-quality stainless steel that is used in our pump's flow path.

**The combination of our piston and seal has undergone extensive testing** under temperature stress, with all common HPLC solvents, and in many instruments. More importantly, they yield consistent, reproducible results in highly demanding..



### Tips & Tools

Be sure to properly position the Active Inlet Valve cable when you reinstall the valve.

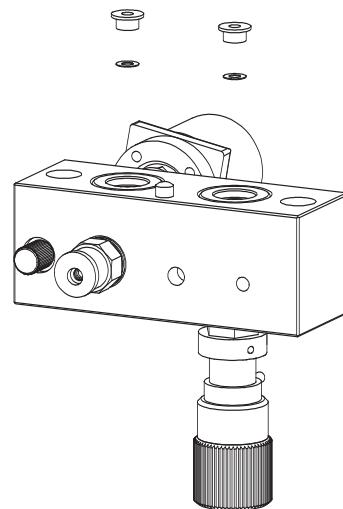
## Changing the Pump Seals

### (All pumps except the G1361A preparative pump)

Pump seals should be replaced when there are leaks on the bottom of the pump head, when retention times are inconsistent, or when the pressure ripple is unstable.

1. Disassemble the pump head and use a piston to remove the two seals.
2. Clean the pump chambers and seal areas by flushing with solvent and wiping with a lint-free cloth.
3. Insert new seals.
4. Reassemble the pump head.
5. Perform the seal wear-in procedure (Standard seals 5063-6589 only).

The wear-in procedure involves flushing the seals with isopropanol at high pressure while they are in place.



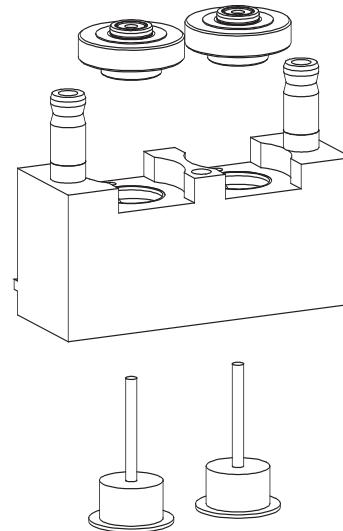
Description	Unit	Part No.	Price (\$)
Sapphire Piston		5063-6586	113
Piston Seals, graphite filled Teflon (reversed phase)	2/pk	5063-6589	84
Piston Seals, polyethylene (normal phase)	2/pk	0905-1420	109
Piston housing assembly (includes springs)		G1311-60002	113
Extended PM kit 1100/1050 pumps, Contains 1ea: 5063-6589 piston seal, 01018-22707 PTFE frits (5/pk), 5062-8562 cartridge active inlet valve, G1311-60012 outlet valve & 2 5063-6586 pistons		5065-4499	714

## Changing and Inspecting the Sapphire Pistons

### (All pumps except the G1361A preparative pump)

Each time you replace the seals, examine the pistons for scratches, which can cause small, but damaging leaks.

1. Disassemble the pump head assembly.
2. Remove any deposits – particularly buffers – from the piston surface using alcohol or toothpaste. Replace the pistons if scratched.
3. Rinse thoroughly in alcohol and HPLC-grade water.
4. Reassemble the pump head.
5. Check to make sure there are no fractures in the springs. Replace piston housing assembly if springs are damaged.
6. Reinsert the pistons.



### Seal Wear-In Procedure

### Recommended after replacing standard seals only (5063-6589)

**Important: Do not perform this procedure when installing normal phase seals (0905-1420).** It will cause severe damage to the seals.

#### Tools

- Solvent bottle or beaker
- Isopropanol
- AIV adapter (0100-1847)
- Restriction capillary (5022-2159)

1. Fill the bottle with 100 ml of isopropanol, and place it in the solvent cabinet. Then, place the new pump head's tubing (including bottle head assembly) into the bottle.
2. Screw the adapter to the Active Inlet Valve. Connect the inlet tube from the bottle head directly to the adapter. (quat pumps and binary pumps with selection valves only)
3. Connect the restriction capillary to the purge valve. Insert the other end of the capillary into a waste container.
4. Open the purge valve and purge the system for 5 minutes with isopropanol at a flow rate of 2 ml/min.
5. Close the purge valve and set the flow to a rate that is adequate to achieve a pressure of 350 bar. Pump for 15 minutes at this pressure to wear in the seals. You can monitor the pressure at your analog output signal using the handheld controller, ChemStation or any other controlling device connected to your pump.
6. Turn OFF the pump flow and slowly open the purge valve to release pressure from the system.
7. Disconnect the restriction capillary and reconnect the outlet capillary to the purge valve. Reconnect the appropriate tubing to the Active Inlet Valve.
8. Rinse your system with the solvent that you plan to use for your next application.



### Tips & Tools

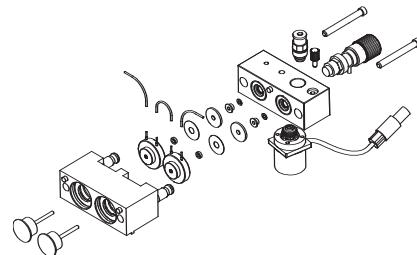
To learn more about Agilent's complete portfolio of services, please visit [www.agilent.com/chem/service](http://www.agilent.com/chem/service), or see page 61 of this guide.

**Pump Head with Seal Wash Kit** (Used with standard and capillary pump)

The routine use of highly concentrated buffer solutions (100 mM) will reduce the life of the seals and pistons in your 1100 Series pump. But you can counteract the problem with one of our seal wash kits, which flushes the backside of the seal with a wash solvent; water/isopropanol (90/10) is recommended as the wash solvent. The continuous seal wash uses gravity to flow the wash solvent, and is compatible with all

1050 and 1100 standard and capillary pumps. The active seal wash uses a peristaltic pump to flow the wash solvent, and is compatible with 1100 pumps with the following serial numbers and higher:

G1310A: DE40906378  
G1311A: DE40926032  
G1312A: DE40914884



Description	Part No.	Price (\$)
Continuous seal wash kit Includes: 2 wash seal gaskets, 4 m flex tubing, 2 pump seals, 1 flow regulator, 2 seal keepers, 2 support ring assemblies, 20 mL luer lock syringe, seal insert tool, abrasive paper	01018-68722	508
Silicone tubing, 1 mm ID, 3 m	0890-1764	17
Seal Keeper	5001-3743	83
Wash seal	0905-1175	45
Wash seal gasket, 6/pk	5062-2484	29
Active seal wash kit for iso or quat pumps Includes: 2 wash seal gaskets, 2 pump seals, peristaltic pump (includes pump cassette and motor), 2 seal keepers, 2 support ring assemblies, seal insert tool, silicone tubing	G1311-68711	855
Active seal wash kit for binary pumps Includes: 4 wash seal gaskets, 4 pump seals, 2 peristaltic pumps (includes pump cassette and motor), 4 seal keepers, 4 support ring assemblies, seal insert tool, silicone tubing	G1312-68711	1318
Peristaltic pump cassette with silicone tubing	5042-8507	34

**Parts and Supplies****G1376A 1100 Series Capillary Pump**

Description	Part No.	Price (\$)
Accessory kit for capillary pump	G1376-68705	626
Inline filter assembly with 0.5 µm pore size filter	5064-8273	130
Replacement frits 0.5 µm for 5064-8273, 10/pk	5022-2185	13
Torque Adapter	G1315-45003	34
Bottle head assembly with tubing and filter	G1376-60003	93
Solvent inlet filter, stainless steel	01018-60025	78

## G1361A 1100 Series Prep Pump



Description	Part No.	Price (\$)
O-ring, Viton, 30 mm	0905-1516	9
Glass filter, solvent inlet, 40 µm pore size	3150-0944	40
SS filter assembly with PEEK ring, 2 µm pore size	5022-2192	17
Solvent bottle, clear, 2 L, 2 inlets	5065-4421	53
Solvent bottle, amber, 2 L	9301-6341	52
Solvent bottle, clear 2 L	9301-6342	19
Sapphire plunger for prep pump	G1361-22402	252
Frit adapter	G1361-23204	10
Peristaltic pump	5065-4445	36
Valve assembly, inlet/outlet for prep pump	G1361-60012	86
SS capillary, 0.6x173 mm, 2 1/16" male	G1361-67300	61
SS capillary, 0.6x175 mm, 2 1/16" male	G1361-67301	61
SS capillary, 0.6x400 mm, 2 1/16" male	G1361-67302	61
SS capillary, 0.5x160 mm, 2 1/16" male	G1361-67303	61
SS capillary, 0.6x111 mm, 1/16" male	G1361-67304	61
SS capillary, 0.6x40 mm, 1/16" male	G1361-67305	61
SS capillary, 0.6x367 mm, 1/16" male	G1361-67306	61

## G1311/12/54A Pump Accessories

Description	Part No.	Price (\$)
Bottle Head Assembly, Filter for F29/32 tapered inlet bottle	G1312-68706	70
Solvent reservoir, 1 L, F29/32	9301-0656	40
Bottle Head Assembly, Screw bottle, with drawing tube and filter	G1311-60003	76
Solvent reservoir, 1 L	9301-1420	13
Solvent Reservoir 1 L with cap	9301-1421	15
Solvent reservoir, amber, 1 L, for use with bottle head assembly	9301-1450	25
Solvent mixer, 1100 Series	G1312-87330	187
Capillary, damper to purge valve	G1312-67301	53

## Solvent Filtration

Unfiltered solvents or solvents contaminated with microbial growth – especially aqueous buffer solutions – present a common problem in HPLC. Aqueous media encourage microbial growth that can clog the solvent inlet filter and the HPLC; particulates in unfiltered solvents can have the same affect. Both microbial growth and particulates can also impact the performance of the pump. For instance, blocked solvent inlet filters can cause erroneous mobile phase composition, which will impact peak elution time. In addition, if the pump keeps working while the filters are blocked, the pump could draw in air instead of solvent. This will result in periodic baseline disturbances.

To avoid these problems we recommend these precautions:

- Use sterile solvent bottles, if possible.
- Filter solvents through sterile filters (< 1  $\mu\text{m}$ ).
- Replace solvents every two days.
- Avoid exposure to direct sunlight, or use brown glass bottles.

### Solvent Filter/Degasser

An added benefit of filtering solvents is that they are degassed at the same time. This is particularly beneficial if you do not have an on-line degasser in your system. The benefits of solvent filtration:

- Degasses eluents as particulates are removed.
- Prevents the formation of spurious peaks within the detector due to solvent outgassing at the low-pressure end of the chromatograph.

- Increases solvent inlet lifetime.
- Eliminates pump downtime caused by air locks and particulates in check valves.
- Decreases piston wear, while increasing column life.



3150-0577

Description	Unit	Part No.	Price (\$)
HPLC Solvent filter/degasser assembly		3150-0577	469
Regenerated Cellulose Filter Membranes 47 mm, pore size 0.45 $\mu\text{m}$	100/pk	3150-0576	164
Nylon Filter Membranes 47 mm, pore size 0.45 $\mu\text{m}$	100/pk	9301-0895	152
PTFE Filter Membranes 47 mm, pore size 0.45 $\mu\text{m}$	10/pk	3150-0509	42
Glass funnel, 250 ml, for 3150-0577		5188-2743	127
PTFE Coated sieve, for 3150-0577		5188-2744	153
PTFE seal, for 3150-0577		5188-2745	25
Funnel base, glass, for 3150-0577		5188-2746	180

## Cleaning or Replacing the Solvent Inlet Filters

Clean or replace the solvent inlet filters at least once every 3 months. Stainless steel filters can be sonicated in isopropanol; however, glass filters cannot be sonicated as glass particles may break off or the filters may shatter.

To test if a solvent inlet filter is blocked, disconnect the solvent inlet tube at the end furthest from the filter and bottle head assembly. If the filter is in good condition, solvent will flow freely out of the solvent tube. If there is a blockage, little or no solvent will drip from the tube.

If a blockage occurs, it's easiest to simply replace the solvent inlet filter. However, you can clean a glass filter by using the following procedure:

1. Remove the solvent inlet filters.
2. Replace the glass frit filters, or soak them in concentrated nitric acid (35%) for one hour. Be sure to flush well to avoid column damage.
3. Install either the new or cleaned solvent filters.



Part No.	Inlet Frit		Part No.	Frit Adapter		Frit Inlet ID (mm)	Tube OD (mm)	Recommended Use
	Description	Price (\$)		Description	Price (\$)			
5041-2168	Glass filter, solvent inlet 20 $\mu\text{m}$ pore size	39	5062-8517	Frit adapter, PTFE, 3 mm, 4/pk	27	5	3.2	analytical scale, micro scale
3150-0944	Glass filter, solvent inlet, 40 $\mu\text{m}$ pore size	40	G1361-23204	Frit adapter, 4mm, PTFE	10	7	4	Preparative LC
3150-0944	Glass filter, solvent inlet, 40 $\mu\text{m}$ pore size	40	G2258-23201	Frit adapter, PTFE for 1/8" od tubing	16	7	3.2	G2258A Dual Loop autosampler

## In-Line Filters

Column inlet frit contamination can increase column back pressure and reduce efficiency.

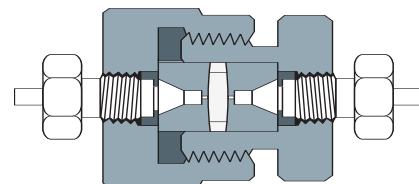
Microbore column blockages are a particular problem, due to the small diameter of the inlet frit. To prevent blockages, always use the appropriate filters in your LC system.

Agilent offers two types of high pressure in-line filter kits for use with any HPLC system:

### Universal solvent filter

#### A high-capacity filter with built-in efficiency.

Universal solvent filters are installed between the LC pump and the injector, so particles from the solvent can be removed *before* they reach the injector. The filter assembly consists of a 4.8 mm frit, two inserts and a two-piece holder. The frit is placed between the tapered edges of the inserts in such a way that the solvent is evenly distributed over the whole surface of the frit. This provides efficient filtration and extends the life of the frit.



### Low-volume column inlet filter

#### Ideal for microbore, narrow-bore, high-speed or standard analytical columns.

This low-volume column inlet filter is positioned immediately before the LC column, so it can remove particles from both the injection system and the sample. With a frit diameter of only 2.1 mm – plus tapered inserts – this filter minimizes external bandspreading while maximizing the filtration capacity.

## HPLC In-line filters

Description	Part No.	Price (\$)
Low dispersion in-line filter Includes one 1.6 mm 2 µm frit, filter holder with inserts, 60 x 0.12 mm connecting capillary	01090-68702	132
Replacement frits for 2.1 mm columns, 2 µm, 10/pk	280959-904	51
Replacement frits for 2.1 mm columns, 0.5 µm, 10/pk	280959-907	61
Universal solvent filter kit Includes one 4.8 mm 2 µm frit, filter holder with inserts, 130 x 0.25 mm connecting capillary	01090-68703	167
Replacement frits, 4.8 mm, 2/pk	01090-27609	36

## Vacuum Degasser Parts and Supplies

### G1322A 1100 Series Vacuum Degasser

Description	Part No.	Price (\$)
Online degasser accessory kit Includes 8 screws, 8 bushings, 4 markers, tubing, syringe, syringe adapter	G1322-68705	44
Glass filter, solvent inlet, 20 µm	5041-2168	39
Disposable Syringes, 20 mL, 10/pk	5062-8534	10
Syringe Adapter, 1/16 in od, 2 in long	9301-1337	20
Tefzel Ferrules and SS Lock Rings, 1/8in, 10/pk	5063-6598	31
PPS nuts, 1/8 in, 1/4-28 thread, 10/pk	5063-6599	23
Union, 1/4 - 28 threads, Polypropylene	5022-2155	37
Teflon Solvent tubing	5062-2483	27
Tubing kit, degasser to pump	G1322-67300	41
Mounting tool for flangeless nut	0100-1710	9
Plastic tubing cutter	8710-1930	31



5063-6598



5063-6599

### G1379A 1100 Series Micro Vacuum Degasser

Description	Part No.	Price (\$)
Dual-channel micro degasser vacuum chamber	G1379-60001	522
Tubing kit, micro vacuum degasser	G1379-67300	34
Mounting tool for flangeless nut	0100-1710	9



0100-1710



### Maintenance Minder

To clean the vacuum degasser, flush the system with isopropanol. After using buffers, flush the degasser with water.

# Detector Maintenance

*Promoting optimal performance and functionality.*

To maintain your HPLC System's level of productivity, you need to perform regular maintenance on your variable wavelength, diode array and multiple wavelength detectors.

In the pages to come, you'll discover tips and techniques that will help you keep your detectors operating at maximum efficiency. For example, you'll learn how to ...

- Choose the most compatible flow cell for your unique application.
- Disassemble, clean and install the flow cell.
- Change the deuterium lamp, and more.

And of course, you'll also find the precision-engineered Agilent parts you need to get the job done – including a range of Agilent flow cells to fit every type of detector.



*"It's all about finding solutions to analytical problems, even under severe time constraints. It's also about understanding our customer's environment completely, so we can put the highest quality products – and deepest application knowledge – to work within that environment."*

**Friedrich Mandel**  
**Senior Application Chemist,**  
**Mass Spectrometry**

## CATALOG



For a complete selection of Injection Valves, see  
**Agilent's 2005-2006 Essential Chromatography Catalog.**  
Or visit our online catalog at [www.agilent.com/chem/6ecatalog](http://www.agilent.com/chem/6ecatalog).

## Variable Wavelength Detector

It is critical to verify the function of the VWD on a regular basis. There are two built-in tests to help you accomplish this:

- **The wavelength calibration test.**
- **The lamp intensity test.** If the lamp intensity has diminished more than is tolerable for your application, you will need to replace the lamp.

Additionally, you should perform the following routine maintenance procedures:

- Check the waste outlet.
- Clean the leak sensor.
- Check the photocurrent.
- Clean or replace the flow cell windows when they become dirty.

Description	Part No.	Price (\$)
G1314A VW detector accessory kit Includes 1/4 in waste tubing, 2 hex keys, 2 wrenches, outlet tubing, 1/16 in PEEK male fitting	G1314-68705	116
Deuterium lamp (1000 hours)	G1314-60100	531
Deuterium longlife lamp	2140-0813	852
VWD inlet tubing with fitting, 0.18 x 40 mm, PEEK	5062-8522	33
VWD outlet tubing with fitting, 0.25 x 48 mm, PEEK	5062-8535	52

### Choosing the Optimal Flow Cell For Your Variable Wavelength Detector

Agilent offers four flow cell options for the VWD. Use the chart below to select the appropriate one for your application, keeping the following guidelines in mind:

- If more than one selection is appropriate, choose the **larger** flow cell to get the best detection limit.
- For columns capable of providing narrower peak widths (1.8  $\mu$ m particle size), the **smaller** flow cell may be more appropriate.
- Flow cells with longer path lengths provide better signal detection. However, a longer path length also increases the cell volume, which causes more peak dispersion.

### VWD Flow Cell Selection

Typical Column Length (cm)	Typical Peak Width	Recommended Flow Cell	High Pressure Flow Cell	For Pressure Above 100 bar
< = 5	0.025	Micro Flow Cell		
10	0.05	Semimicro Flow Cell		
20	0.1		Standard Flow Cell	
> = 40	0.2			For Pressure Above 100 bar
Typical Flow Rate		0.05 - 0.2 ml/min	0.2 -0.4 ml/min	0.4-0.8 ml/min
Internal Column Diameter		1.0 mm	2.1 mm	3.0 mm
				4.6 mm
				0.05 - 5 ml/min

## Disassembling and cleaning the cell

How to remove the cell:

1. Remove both capillaries from the flow cell.
2. Unscrew the cell screws and remove the flow cell.

How to disassemble the cell windows:

1. Open the cell with a 4 mm hexagonal key.
2. Use tweezers to remove the conical springs and gaskets.
3. Remove the cell windows with scotch tape. **Important:** **Do not remove the flow cell windows with tweezers if you plan to reuse them. The tweezers will scratch the windows' fragile surface.**
4. Use ethanol to clean the cell body.
5. Use a cotton swab and ethanol to clean the cell windows. **Note:** if you work with proteins, you may want to try a contact lens cleaner. Or, simply replace the windows.
6. Make sure that no deposits are on the window or cell body.

## Reassembling the cell windows and cell

1. Insert Gasket #2. **Note:** The hole of gasket #2 is larger than the hole of gasket #1.
2. Install the cell window.
3. Insert Gasket #1.
4. Insert the SST ring.
5. Install the conical springs. **Note:** Install the conical springs with the conical side toward the cell window. This will ensure correct placement of the conical springs, which is critical to proper tightness.
6. Carefully tighten the cell screw.

The cell repair kit includes the required cell windows (pack of 2) and gaskets.

## Installing the Detector Cell

*Before you return the flow cell to the instrument module ...*

1. Connect the capillaries.
2. Switch on the pump and check the cell for leaks.

**Once you are convinced the cell is leak free ...**

3. Install the flow cell into the instrument.
4. Screw down the cell.

**We recommend the following tests after cell installation:**

Zero-order calibration

Wavelength calibration

Because the flow cell is part of the optical system and has now been moved since these tests were last performed, we recommend running them again before your next analysis.

There are two designs of the Standard Flow Cell. The cell screw of the new design, G1314-60086, is painted black.

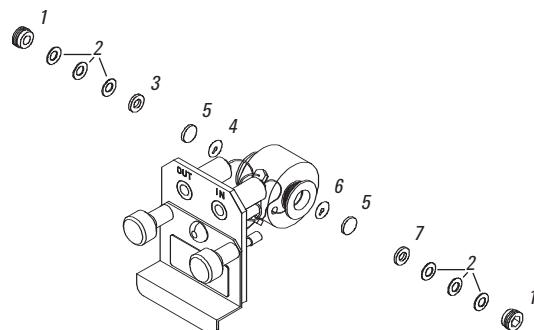


### Tips & Tools

A vital parameter of the VWD is backpressure on the cell. Make certain that you use the appropriate capillary from the detector flow cell to the waste accessory. Part number: 5062-8535

## G1314-60086 Standard Flow Cell Replacement Parts

Item	Description	Unit	Part No.	Price (\$)
	Standard "D" type flow cell 10 mm, 14 $\mu$ L, 40 bar		G1314-60086	963
	Standard "D" flow cell kit Includes 2 windows, 2 gaskets #1, 2 gaskets #2		G1314-65061	132
1	Cell screws	2/pk	G1314-65062	12
2	Conical spring	10/pk	79853-29100	36
3	Ring #1, PEEK	2/pk	G1314-65065	39
4	Gaskets #1, Kapton	10/pk	G1314-65063	216
5	Quartz windows	2/pk	79853-68742	132
6	Gaskets #2, Kapton	10/pk	G1314-65064	229
7	Ring #2, PEEK	2/pk	G1314-65066	49

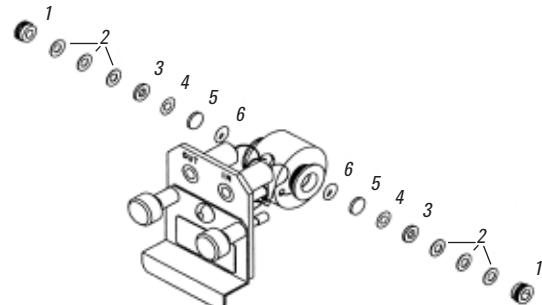


## Tips &amp; Tools

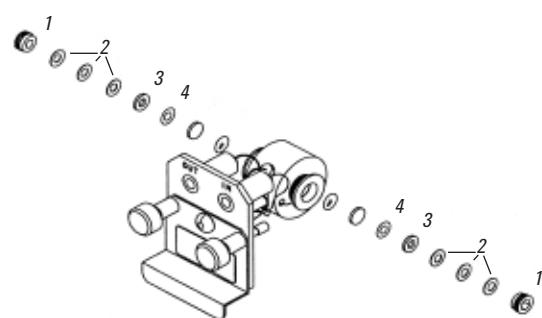
The semi-micro and micro flow cells are similar to the standard flow cell.

**G1314-60080 Standard Flow Cell Replacement Parts**

Item	Description	Unit	Part No.	Price (\$)
	Standard "D" flow cell kit Includes 2 windows, 2 gaskets #1, 2 gaskets #2		G1314-65050	187
1	Cell screw		79853-27200	33
2	Conical spring	10/pk	79853-29100	36
3	Ring, SS	2/pk	79853-22500	84
4	Gasket #1, PTFE	10/pk	79853-68743	247
5	Quartz windows	2/pk	79853-68742	132
6	Gasket #2, PTFE	10/pk	G1314-65051	105

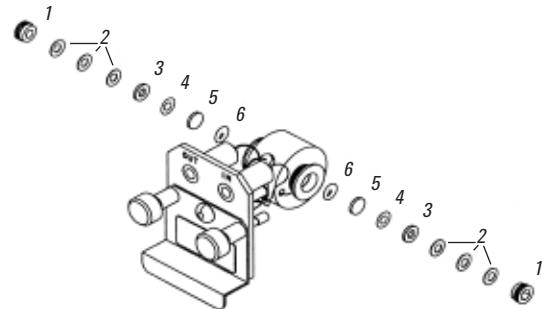
**G1314-60083 Semi-micro Flow Cell Replacement Parts**

Item	Description	Unit	Part No.	Price (\$)
	Semi-micro flow cell assembly 6 mm, 5 $\mu$ L, 40 bar		G1314-60083	1090
	Semi-micro flow cell kit Includes 2 windows, 4 gaskets: 2 standard #1, 1 semi-micro #1, 1 semi-micro #2		G1314-65056	187
1	Cell screw		79853-27200	33
2	Conical spring	10/pk	79853-29100	36
3	Ring, SS	2/pk	79853-22500	84
4	Quartz windows	2/pk	79853-68742	132

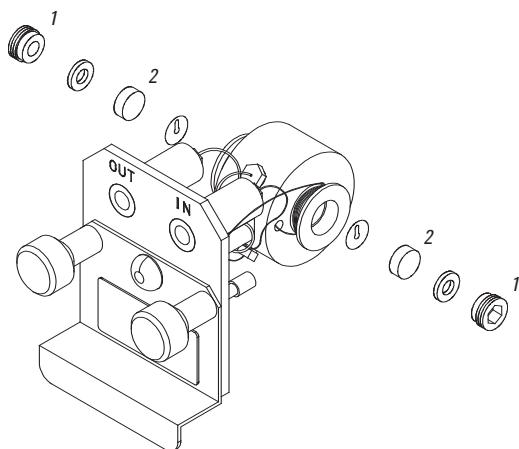


**G1314-60081 Micro Flow Cell Replacement Parts**

Item	Description	Unit	Part No.	Price (\$)
	Micro flow cell 5 mm, 1 $\mu$ L, 40 bar		G1314-60081	1511
	Micro flow cell kit Includes 2 windows, 2 gaskets #1, 2 gaskets #2		G1314-65052	191
1	Cell screw		79853-27200	33
2	Conical spring	10/pk	79853-29100	36
3	Ring, SS	2/pk	79853-22500	84
4	Quartz windows	2/pk	79853-68742	132
5	Gasket #1, PTFE	10/pk	79853-68743	247
6	Gasket #2, PTFE	10/pk	G1314-65053	117

**G1314-60082 High Pressure Flow Cell Replacement Parts**

Item	Description	Unit	Part No.	Price (\$)
	High pressure flow cell 10 mm, 14 $\mu$ L, 400 bar		G1314-60082	2490
	High pressure flow cell kit Includes 2 windows, 2 Kapton gaskets, 2 PEEK rings		G1314-65054	357
1	Cell screw		79853-27200	33
2	Window, UHP	2/pk	79853-68734	300

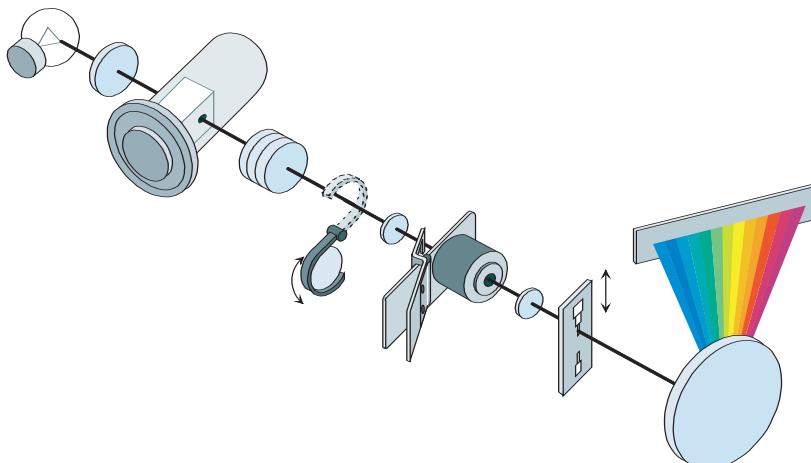


## Diode Array Detector (DAD), Multiple Wavelength Detector (MWD)

### DAD Routine Maintenance Procedures:

**Perform the intensity test and detector cell test.** These built-in tests will help you verify the performance of your diode array, and determine when maintenance is necessary.

- Clean or replace the flow cells as needed.
- Perform a wavelength calibration to ensure wavelength accuracy.
- Clean the leak sensors and check their function.
- Inspect the positioning of the waste tube.
- Exchange the lamp.
- Perform a dark current and filter test.



### Tips & Tools



The high-pressure flow cell has two PEEK rings.

### Changing the Deuterium Lamp

You should replace the deuterium lamp when the baseline noise and/or drift exceed your application limits – or if the lamp does not light. Use the following procedure:

1. If the detector has been in use, turn it off and allow it to cool before proceeding.
2. Remove the front cover.
3. Disconnect the electrical connection, and unscrew the lamp to remove it from the DAD.
4. Replace with a new lamp, taking care not to touch the glass surface with your hands.
5. Tighten the screws and reconnect the lamp to its electrical connection.
6. Replace the front cover.
7. Reset the lamp counter and turn on the lamp. Allow it to warm up for 10 - 20 minutes. Note: The new 'C' type detectors use lamps with a chip installed to automatically count used lamp time.

Description	Part No.	Price (\$)
Deuterium lamp, 1100 DAD/MWD longlife	5181-1530	852
Deuterium lamp, 1100 DAD/MWD	2140-0590	581
Tungsten Lamp assembly, G1315A, 8453	G1103-60001	135
Deuterium lamp, 1100DAD/MWD, long life, A	2140-0813	852
Deuterium lamp, 1100 DAD/MWD, long life, CFor G1315C DAD and G1365C MWD	2140-0820	841



**Agilent's 1100 series DAD lamp** can help you achieve optimal performance with these innovative features:

- A lifetime of over 2000 hours.
- Precise alignment.
- Thermal stability.
- Easier handling during installation and removal.



### Maintenance Minder

When removing the lamp ... unscrew both screws and unplug the lamp.  
When installing the lamp ... be sure to place the lamp into its auto-aligning housing and screw snuggly.

## Choosing the Optimal Flow Cell

Agilent offers eight flow cells for use with the diode array and multiple wavelength detectors. Use the chart below to select the appropriate one for your application, keeping the following guidelines in mind:

If more than one selection is appropriate, choose the **larger** flow cell to get the best detection limit.

For columns capable of providing narrower peak widths (1.8  $\mu\text{m}$  particle size), the **smaller** flow cell may be more appropriate.

Flow cells with longer path lengths provide better signal detection. However, a longer

path length also increases the cell volume, which causes more peak dispersion.

For information on selecting prep cells, please refer to our technical note G1315-90102 under Library Information at [www.agilent.com/chem](http://www.agilent.com/chem)

## DAD/MWD Flow Cell Selection

Typical Column Length (cm)	Typical Peak Width	Recommended Flow Cell		
< = 5	0.025	500 nl Flow Cell		
10	0.05	Semimicro Flow Cell		
20	0.1		Standard Flow Cell	High Pressure Flow Cell
> = 40	0.2			
Typical Flow Rate		0.05 - 0.2 ml/min	0.2 - 0.4 ml/min	0.4-0.8 ml/min
Internal Column Diameter		0.3 - 1 mm	2.1	3.0 mm
				4.6 mm
				0.05 - 5ml/min

## Flow Cell Maintenance Tips

Step 1: Remove the capillaries.

- Perform a wavelength calibration to ensure wavelength accuracy.

Step 2: Take out the cell.

- Clean the leak sensors and check their function.

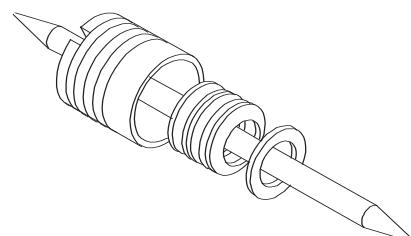
Step 3: Remove the cell screw and gasket.

- Inspect the positioning of the waste tube.
- Exchange the lamp.

• Perform the intensity test and detector cell test. These built-in tests will help you verify the performance of your detector, and determine when maintenance is necessary.

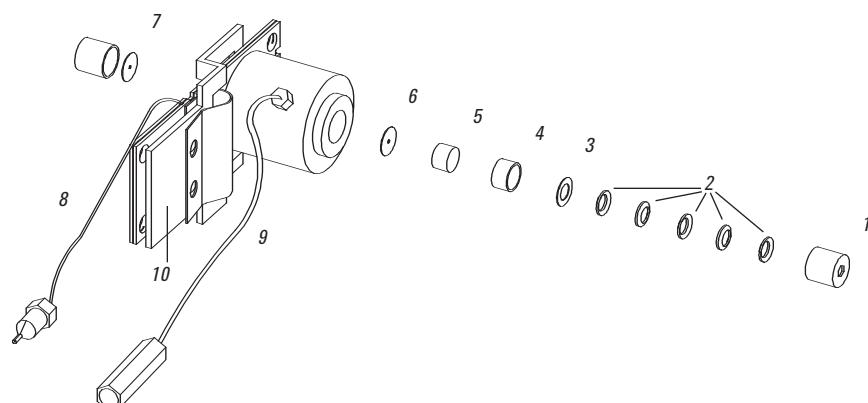
- Perform a dark current and filter test.

• Clean or replace the flow cell windows as needed.



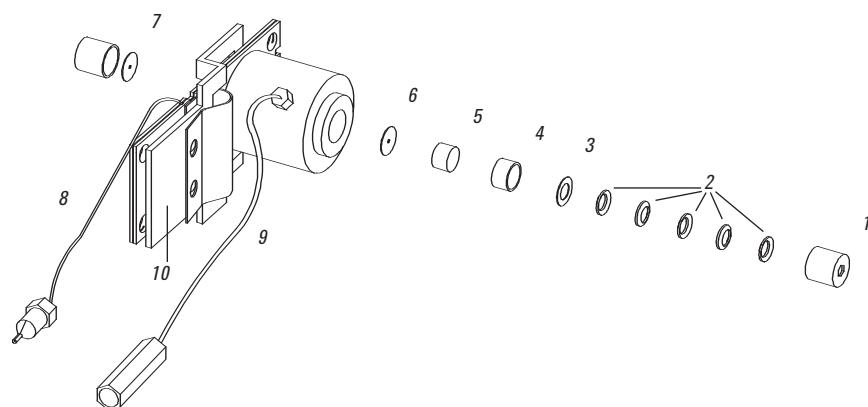
## G1315-60012/22 Standard Flow Cell and Replacement Parts

Item	Description	Unit	Part No.	Price (\$)
	Standard flow cell 10 mm, 13 $\mu$ l, 120 bar		G1315-60012	791
	Standard flow cell 10 mm, 13 $\mu$ l, 120 bar RFID tag		G1315-60022	1080
1	Window screw		79883-22402	70
2	Spring washers	10/pk	5062-8553	13
3	Compression washer		79883-28801	20
4	Window holder		79883-22301	30
5	Quartz window		1000-0488	36
6	Seal BACK	12/pk	G1315-68711	82
7	Seal FRONT	12/pk	G1315-68710	82
8	Capillary inlet with heat exchanger		G1315-87321	76
9	SS Tubing 0.17 mm, 200 mm long		G1315-87302	76
10	Clamp unit		G1315-84901	18
	Zero dead volume fitting		0100-0900	80
	Cell repair kit Includes window screw kit, 4 mm hexagonal wrench and seal kit		G1315-68712	285



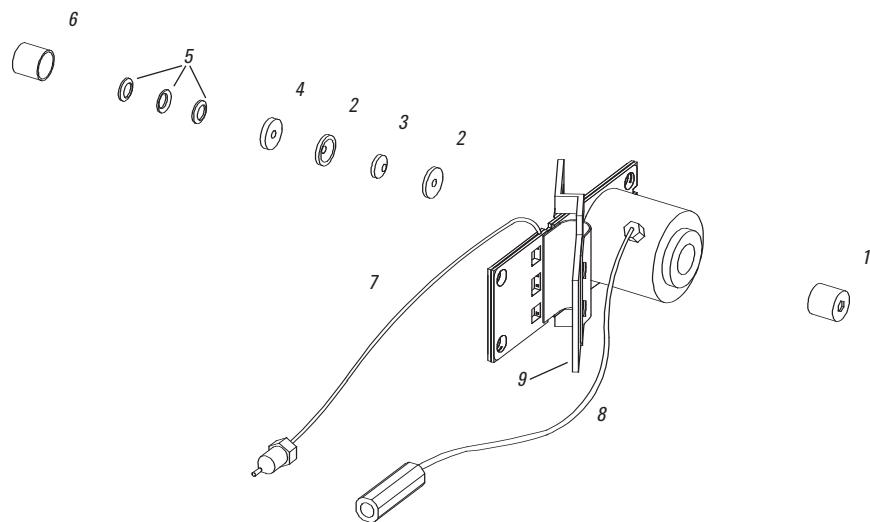
**G1315-60011 Semi-Micro Flow Cell and Replacement Parts**

Item	Description	Unit	Part No.	Price (\$)
	Semi-micro flow cell 6 mm, 5 $\mu$ l, 120 bar		G1315-60011	791
1	Window screw		79883-22402	70
2	Spring washers	10/pk	5062-8553	13
3	Compression washer		79883-28801	20
4	Window holder		79883-22301	30
5	Quartz window		1000-0488	36
6	Seal BACK	12/pk	79883-68702	105
7	Seal FRONT	12/pk	G1315-68710	82
8	Capillary inlet with heat exchanger 0.12 mm, 290 mm long		G1315-87325	76
9	Capillary outlet 0.12 mm, 200 mm long		G1315-87306	76
10	Clamp unit		G1315-84901	18
	Screw M 2.5, 4 mm long for cell body/clamp		0515-1056	1
	Cell repair kit, semi-micro Includes window screw kit, 4 mm hexagonal wrench and seal kits		G1315-68713	285



## G1315-60015 Micro/High Pressure Flow Cell and Replacement Parts

Item	Description	Unit	Part No.	Price (\$)
	Micro/high pressure flow cell 6 mm, 1.7 $\mu$ l, 400 bar		G1315-60015	1605
1	Window assembly		79883-68703	152
2	Seal ring		79883-27101	43
3	Quartz window		1000-0953	206
4	Compression washer		79883-28802	33
5	Spring washers	10/pk	5062-8553	13
6	Window screw		79883-22404	63
7	Capillary inlet with heat exchanger 0.12 mm, 290 mm long		G1315-87325	76
8	Capillary outlet 0.12 mm, 200 mm long		G1315-87306	76
9	Clamp unit		G1315-84901	18
	Screw M 2.5, 4 mm long for cell body/clamp		0515-1056	1
	Capillary 0.12 mm, 150 mm long		G1315-87312	76
	Capillary 0.17 mm, 380 mm long		G1315-87311	76
	Cell repair kit Includes 1 quartz window, 5 spring washers, 2 seal rings		79883-68700	300



**Nano Flow Cells**

Description	Part No.	Price (\$)
500 nl Flow Cell for 1100 DAD/MWD Contains quartz flow cell with 10 mm path length and 500 nl volume, connecting capillaries, max 50 bar pressure	G1315-68724	2050
80 nL Flow Cell for 1100 DAD/MWD Contains quartz flow cell with 6 mm path length and 80 nl volume, connecting capillaries, max 50 bar pressure	G1315-68716	2554
Sealing kit for 500 nl flow cell Includes torque adapter, 2 cell seal assemblies, 5 litetouch front and back ferrules	G1315-68715	276
Sealing kit for 80nl flow cell Includes torque adapter, 2 cell seal assemblies, 5 litetouch front and back ferrules, 5 sleeves for 360 $\mu$ m od capillaries	G1315-68725	247

**Prep Flow Cells**

Description	Part No.	Price (\$)
Prep Flow Cell-SST, 3 mm, 120 bar	G1315-60016	913
Prep Flow Cell Quartz, 0.3 mm, 20 bar	G1315-60017	2159
Prep Flow Cell Quartz, 0.06 mm, 20 bar	G1315-60018	2159

## LC/MS Supplies

### LC/MSD and LC/MS Trap Supplies

Description	Part No.	Price (\$)
Electron multiplier replacement horn	05971-80103	1004
EM Replacement Horn for the LC/MSD Trap	G2440-60200	1876
Rough pump oil 1 QT	6040-0834	40
API-ES Nebulizer needle	G2427A	119
APCI Nebulizer Needle	G2428A	119
Nebulizer needle ferrule	G1946-20213	38
Corona Needle APCI	G1947-20029	61
Cloth, lint free, 15/pk	05980-60051	64
Abrasive mesh (micro-grit paper)	8660-0852	10
Precision glass capillary for the G1946B and G1946C	G1946-80009	1624
Precision glass capillary with platinum ends for G1946D	59987-20040	1638
Filter assembly	G1946-60180	200
5 µm replacement frits for P/N G1946-60180, box of 5 filters	0100-2051	51
High pressure semi-prep filter	5022-2165	91
10 µm stainless steel frits for P/N 5022-2165, 10/pk	5022-2166	115
Rhebuild kit for active splitter kit Includes 3 rotor seals and 3 stator face assemblies (for G1968-64102)	1535-5215	821



05971-80103

# General Supplies

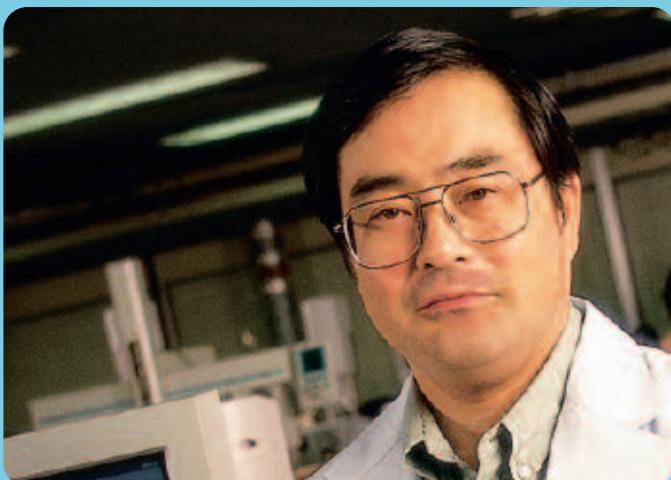
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Agilent offers a wide range of meticulously engineered supplies for operating and maintaining your HPLC system – including:

- LC tubing
- Connectors
- Vials and caps
- Crimpers and decappers
- Sample preparation solutions
- Econofilters and more

In this section, we'll review these key components, and help you make the right choices for your lab.

You can also visit [www.agilent.com/chem](http://www.agilent.com/chem) for a full selection of Agilent LC columns, and to access our comprehensive chromatogram database.



*"As an application supervisor, I'm known for using the phrase 'Don't hesitate to challenge.' It means never look for the easiest, safest route — you might miss something along the way. Instead, do whatever it takes to find the most effective answers."*

**Hiroki Kumagai**



## CATALOG

For a complete selection of Injection Valves, see  
**Agilent's 2005-2006 Essential Chromatography Catalog.**  
Or visit our online catalog at [www.agilent.com/chem/6ecatalog](http://www.agilent.com/chem/6ecatalog).

## Ready-to-Use Econofilter Membrane Syringe Filters

Agilent's industry-standard 25-mm diameter Econofilters are an ideal choice for high sample throughput laboratories. We recommend using them to clarify small-volume HPLC samples that need further analysis – or when particulate matter in the sample solution may cause problems.

Features include ...

- **The same quality membranes** found in Agilent's high-performance syringe filters.
- **An inert polymeric housing** that helps to spread the sample over the membrane's entire surface, so that the maximum capacity is reached.

- **No glue or binders used during construction**, which ensures that no extractables are present.
- **Built-in simplicity** – just attach the Luer-tipped syringe (filled with the sample solution) to the housing, and push the sample through the pre-cleaned filters.

Econofilters have a moderately wide cross sectional area ( $4.2\text{ cm}^2$ ) with a holdup volume of less than 50 microliters. Popular pore sizes of 0.20- and 0.45-micron are available in packages of 200 units. Regenerated cellulose, nylon and PTFE (polytetrafluoroethylene) membranes are also available in these configurations.



### Membrane Econofilters (200/pk)



Description	Part No.	Price (\$)
Econofilter, Regenerated Cellulose 25/20	5185-5830	181
Econofilter, Regenerated Cellulose 25/45	5185-5831	181
Econofilter, Nylon 25/20	5185-5832	194
Econofilter, Nylon 25/45	5185-5833	194
Econofilter, PTFE Membrane 25/20	5185-5834	195
Econofilter, PTFE Membrane 25/45	5185-5835	195



### Tips & Tools

All 1100 HPLC fittings are Swagelok compatible, EXCEPT the ports of the model 7725i Rheodyne valve.

## LC Tubing and Fittings

### What is the Function of LC tubing?

LC tubing creates the sample flow path through your LC system – from the autosampler or manual injection valve ... through the column ... to the detector. The ideal tubing provides an inert surface and leak-free connections, while eliminating dead volumes.

### What advantages does Agilent tubing offer?

Agilent stainless steel and PEEK tubing each provide their own unique benefits:

- Universal Length Stainless Steel Tubing – is precisely measured and pre-cut according to Agilent's exact specifications. Additionally, Agilent 1100 capillary tubing is color-coded based on internal diameters.
- 1/16" OD PEEK Tubing – is flexible and easy to cut to desired lengths. It's also color-coded for easy tracking. Additionally PEEK tubing accepts both stainless steel and PEEK fittings.

### When should I replace the LC tubing?

You should inspect your system periodically, and replace the tubing when you notice ...

- Leaking or loose fittings.
- Pinched or constricted tubing.
- Application changes.

### How can I minimize problems with my LC tubing?

- Choose the narrowest diameter and shortest length that your application and system will allow. This will help prevent peak dispersion or resolution loss.
- Select smaller id tubing (0.12 mm) for narrowbore or microbore applications.
- Use color-coded tubing – or keep track of identifying characteristics – to facilitate maintenance and troubleshooting.

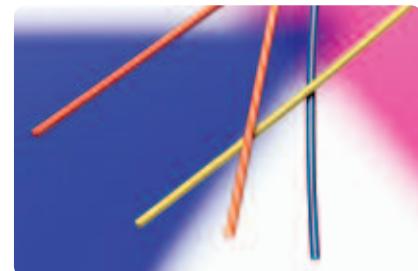
### How do I choose the correct fittings?

To ensure leak-free connections – and to prevent the loss of peak shape and resolution – always use the manufacturer's recommended fittings with columns, valves, and unions. Additionally, keep the following tips in mind:

- Different columns have different fitting requirements. (For example, Zorbax columns use standard Swagelok fittings).
- Agilent 1100 modules use standard Swagelok fittings.
- Rheodyne injection valves require Rheodyne fittings.

## PEEK Tubing

Length (m)	ID (mm)	Color Code	Part No.	Price (\$)
1.5	0.50	Orange	0890-1761	17
1.5	0.25	Blue	0890-1762	17
5	0.25	Blue	5042-6463	49
1.5	0.18	Yellow	0890-1763	21
5	0.18	Yellow	5042-6462	55
1.5	0.13	Red	0890-1915	25
5	0.13	Red	5042-6461	64



Description	Part No.	Price (\$)
Plastic tubing cutter	8710-1930	31
Blades for tubing cutter 5/PK	8710-1931	12



8710-1930

## GENERAL SUPPLIES



0350-1402



5062-8541



0100-1631



5062-2418

### Standard Fittings for 1/16" od Capillaries

Description	Unit	Part No.	Price (\$)
1/16" SS fittings, front and back ferrules	10/pk	5062-2418	129
1/16" SS long fittings, front and back ferrules	10/pk	5065-4454	108
Extra long SS fittings and ferrules	10/pk	5065-9967	120
1/16" SS male fittings	10/pk	5061-3303	64
1/16" SS front ferrules	10/pk	5180-4108	41
1/16" SS back ferrules	10/pk	5180-4114	43
Finger-tight PEEK fittings, beige, 1/16"	10/pk	5063-6591	47
Finger-tight PEEK fittings, beige, 1/16"	2/pk	0100-1516	19
Finger-tight PEEK long fittings, beige, 1/16"	10/pk	5062-8541	68
Finger-tight PEEK fittings, 1/16", 2 each: yellow, blue, black, green, red	10/pk	5065-4426	49
Double winged 2-piece fittings, 1/16"	10/pk	5042-6500	50
PEEK RheFlex 2-piece fittings	5/pk	0100-1631	40
PEEK RheFlex 2-piece fittings, colored	10/pk	0100-2175	55
ChromTrac identifiers, 2 each: black, green, white 4 each: yellow, blue, red	20/pk	0350-1402	42
Blanking Nut 1/16" SS		01080-83202	41

### Unions



0100-0900



5022-2133

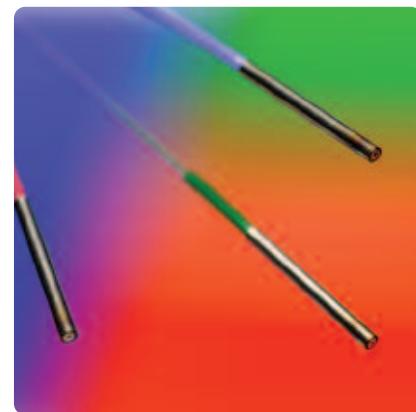
Description	Used In (instrument)	Part No.	Price (\$)
True ZDV Union, no fittings	Nano LC	5022-2145	29
ZDV Union, no fitting	Capillary / Nano / Standard LC	5022-2184	31
ZDV Union, with fittings	Standard LC	0100-0900	80
High flow union, no fittings	Prep LC	5022-2133	38

## Universal Connecting Capillaries

- Made of flexible stainless steel (0.6 mm OD) with 1/16" fittings for both ends.
- Pre-swaged fittings are assembled according to Swagelok specifications.
- Squarely cut, pre-cleaned and ready to use.
- Use with SS fittings and ferrules (5062-2418) or PEEK fittings (0100-1516).
- Non-swaged capillaries include fittings, but not assembled.

### Flexible Stainless Steel Capillaries (without fittings)

ID (mm)	Length (cm)	Color Code	Volume (μl)	Part No.	Price (\$)
0.12	10.5	Red	1.2	5021-1820	28
0.12	15	Red	1.7	5021-1821	28
0.12	20	Red	2.3	5065-9935	28
0.12	28	Red	3.2	5021-1822	28
0.12	40	Red	4.5	5021-1823	28
0.12	50	Red	5.6	5065-9964	28
0.17	10.5	Green	2.4	5021-1816	28
0.17	15	Green	3.4	5021-1817	28
0.17	20	Green	4.6	5065-9931	28
0.17	28	Green	6.4	5021-1818	28
0.17	40	Green	9.1	5021-1819	28
0.17	60	Green	13.6	5065-9933	32
0.17	70	Green	15.9	5065-9932	32
0.17	90	Green	20.5	5065-9963	32
0.25	28	Blue	13.8	5022-6508	28
0.25	80	Blue	39.3	5065-9930	32
0.50	10.5	None	20.6	5065-9927	28
0.50	15	None	29.5	5022-6509	28
0.50	28	None	55	5022-6510	28
0.50	80	None	157	5065-9926	66



## GENERAL SUPPLIES

### Flexible Capillary Connectors

From	To	ID (mm)	Length (cm)	Material	Color Code	Fittings	Part No.	Price (\$)
Pump	Autosampler	0.17	60	SS	Green	Pre-swaged	G1312-67305	56
		0.25	13	SS	Blue	Pre-swaged	01090-87308	98
		0.25	32	SS	Blue	Pre-swaged	79835-87638	105
		0.17	50	SS	Green	With fittings	G1328-87600	57
	Manual Valve	0.17	90	SS	Green	1 end pre-swaged	G1329-87300	65
		0.25	70	SS	Blue	1 end pre-swaged	01018-67305	75
		0.25	70	Ta	Blue	1 end pre-swaged	01019-67305	528
Autosampler	Column	0.12	18	SS	Red	1 end pre-swaged	G1313-87304	57
		0.12	28	SS	Red	1 end pre-swaged	01090-87610	84
		0.12	10.5	SS	Red	1 end pre-swaged	01090-87611	84
		0.17	18	SS	Green	1 end pre-swaged	G1313-87305	59
		0.17	28	SS	Green	1 end pre-swaged	01090-87304	86
		0.17	80	SS	Green	1 end pre-swaged	01048-87302	75
		0.17	13	SS	Green	1 end pre-swaged	01090-87305	59
Manual valve	Column	0.17	50	SS	Green	With fittings	G1328-87600	57
Column compartment	Column	0.12	7	SS	Red	1 end pre-swaged	G1316-87303	57
		0.17	9	SS	Green	With fittings	G1316-87300	46
Column	DAD	0.12	15	SS	Red	Pre-swaged	G1315-87312	76
		0.17	38	SS	Green	Pre-swaged	G1315-87311	76
	VWD	0.18	40	PEEK		With fittings	5062-8522	33
		0.12	10.5	SS	Red	Without fittings	5021-1820	28
	Universal	0.12	15	SS	Red	Without fittings	5021-1821	28
		0.12	28	SS	Red	Without fittings	5021-1822	28
		0.12	40	SS	Red	Without fittings	5021-1823	28
		0.12	7	SS	Red	1 end pre-swaged	G1316-87303	57
		0.17	10.5	SS	Green	Without fittings	5021-1816	28
		0.17	15	SS	Green	Without fittings	5021-1817	28
		0.17	28	SS	Green	Without fittings	5021-1818	28
		0.17	40	SS	Green	Without fittings	5021-1819	28
		0.17	9	SS	Green	With fittings	G1316-87300	46
	VWD	0.25	48	PEEK		With fittings	5062-8535	52

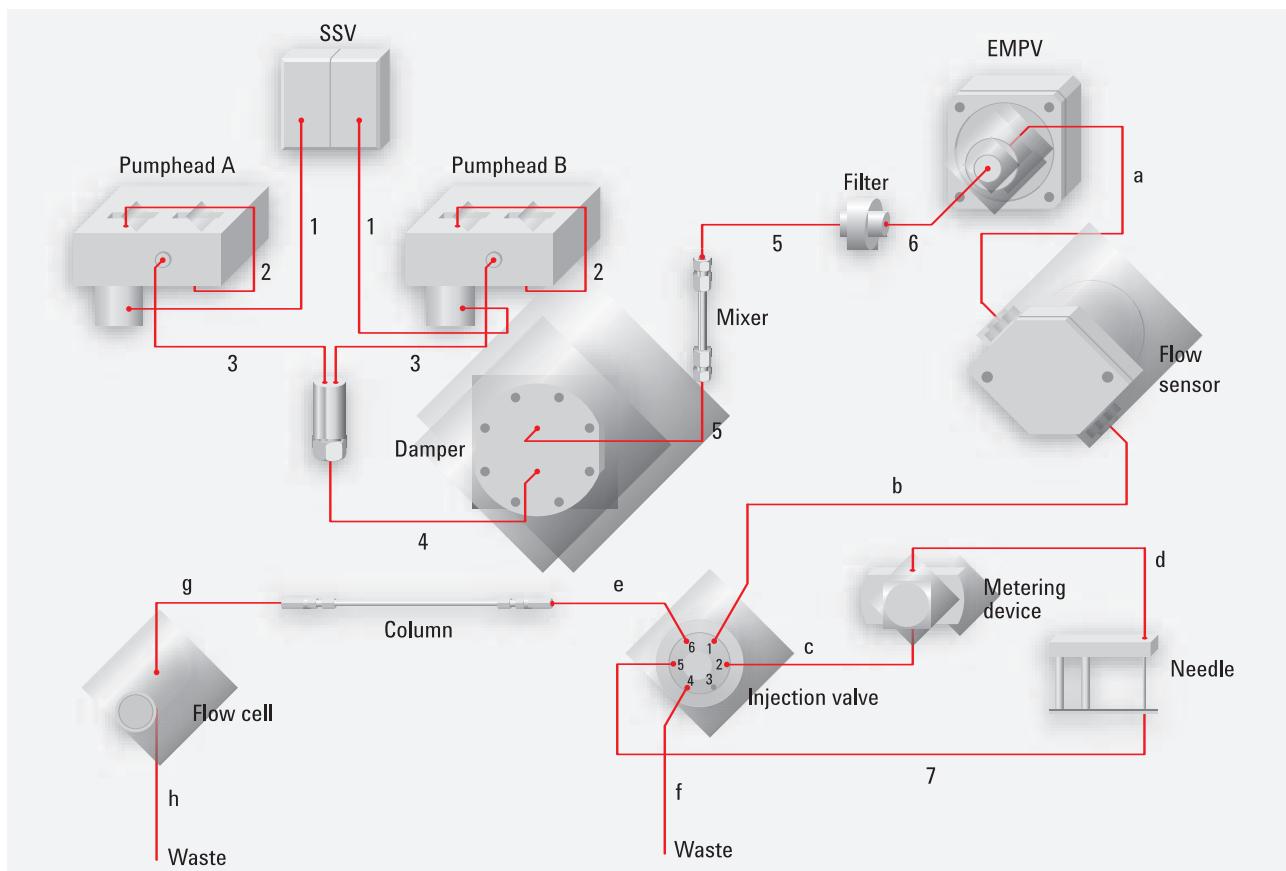
## Capillary and Fitting Kits

Description	Contents	Part No.	Price (\$)
Capillary/fitting starter kit, 0.17 mm ID	<p>Kit includes:</p> <p>Qty 1 - PEEK capillary 0.17 mm id, 1.5m  Qty 4 - Stainless steel capillary, 105 x 0.17 mm  Qty 4 - Stainless steel capillary, 150 x 0.17 mm  Qty 2 - Stainless steel capillary, 200 x 0.17 mm  Qty 2 - Stainless steel capillary, 280 x 0.17 mm  Qty 1 - Stainless steel capillary, 400 x 0.17 mm  Tubing cutter for PEEK capillaries  1/16 in. stainless steel fittings, 10/pk  1/16 in. PEEK fittings, color 10/pk  1/16 in. PEEK fittings, 10/pk  Qty 3 - ZDV union, stainless steel  Rheotool, Cybertool</p>	5065-9939	585
Capillary/fitting starter kit, 0.12 mm ID	<p>Kit includes:</p> <p>PEEK capillary 0.13 mm id, 1.5m  Qty 4 - Stainless steel capillary, 105 x 0.12 mm  Qty 4 - Stainless steel capillary, 150 x 0.12 mm  Qty 2 - Stainless steel capillary, 200 x 0.12 mm  Qty 2 - Stainless steel capillary, 280 x 0.12 mm  Stainless steel capillary, 400 x 0.127 mm  Tubing cutter for PEEK capillaries  1/16 in. stainless steel fittings, 10/pk  1/16 in. PEEK fittings, color 10/pk  1/16 in. PEEK fittings, 10/pk  Qty 3 - ZDV fitting, Rheotool, Cybertool</p>	5065-9937	585
Capillary/fitting starter kit for 1100 Capillary LC System	<p>Kit includes:</p> <p>Qty 2 - Fused silica/PEEK capillary 50<math>\mu</math>m, 55 cm  Qty 1 - Fused silica/PEEK capillary 50<math>\mu</math>m, 20 cm  Qty 1 - Fused silica/PEEK capillary 100<math>\mu</math>m, 110 cm  Qty 2 - Fused silica/PEEK capillary 50<math>\mu</math>m, 50 cm  Qty 2 - Fused silica/PEEK capillary 50<math>\mu</math>m, 40 cm  Qty 4 - 4 mm stainless steel fitting, male 10-32  Qty 4 - 1/32 in. PEEK ferrule and stainless steel lock ring  Qty 4 - PEEK fittings for <math>\mu</math>-valves  Qty 4 - Double winged PEEK nuts and 1/32 in. ferrules  Qty 1 - Cybertool</p>	5065-9938	751
Rapid Resolution High Throughput capillary kit	<p>Kit includes:</p> <p>Qty 5 - Capillaries to optimize the 1100 Series LC for use with RRHT columns</p>	5065-9947	213

## GENERAL SUPPLIES

### PEEK Coated Fused Silica Capillaries for use with 100 $\mu$ l/min Flow range

Item	From	To	Fitting	ID ( $\mu$ m)	Part No.	Price (\$)
a	EMPV	Flowsensor	B/B	100 $\mu$ m	G1375-87305	83
b	Flowsensor	Injection valve	B/C	100 $\mu$ m	G1375-87306	83
c	Injection valve	Metering device	B/C	100 $\mu$ m	G1375-87312	67
d	Metering device	Needle	B/B	100 $\mu$ m	G1375-87303	100
e	Injection valve	Column	C/D	75 $\mu$ m	G1375-87311	83
f	Injection valve	Waste	C/-	100 $\mu$ m	G1375-87307	50
g	Column	Detector	D/E	75 $\mu$ m	G1375-87308	83
h	Detector	Waste	E/-	75 $\mu$ m	G1315-68708	83
	$\mu$ -switching valve	Column	C/D	50 $\mu$ m	G1375-87309	67



## Replacement Fittings and Ferrules for Capillary and Nano Flow System

Graphic	Description	Type	Part No.	Price (\$)
	1/16" SS fittings, front and back ferrules, 10/pk	A	5062-2418	129
	Fitting male, 1/16", 4 mm, SS, 10/pk	B	5063-6593	56
	1/32" ferrule and SS lock ring, 10/pk	B	5065-4423	101
	6 fittings, 2 plugs, PEEK for µ-valves	C	5065-4410	157
	Double winged PEEK nuts and 1/32" ferrules, 10/pk	D	5065-4422	101

## Generic Connecting Capillaries for Capillary LC-System

Item	From	To	Fitting	Part No.	Price (\$)
1	SSV	AIV		G1311-67304	54
2	Piston 1	Piston 2	A/A	G1312-67300	74
3	Pump	Restriction capillary	A/A	G1312-67302	187
4	Mixing capillary	Damper	A/A	G1312-67304	87
5	Damper	Mixer	A/A	01090-87308	98
6	Mixer	Filter	A/A	01090-87308	98
7	Filter	EMPV	A/A	G1375-87400	57
8	Needle seat	Injection valve	-C	G1329-87101	187

## PEEK Coated Fused Silica Capillaries for use with 20 µl/min Flow Range

Item	From	To	Fitting	ID (µm)	Part No.	Price (\$)
a	EMPV	Flowsensor	B/B	50 µm	G1375-87301	83
b	Flowsensor	Injection valve	B/C	50 µm	G1375-87310	83
c	Injection valve	Metering device	B/C	50 µm	G1375-87302	67
d	Metering device	Needle	B/B	100 µm	G1375-87303	100
e	Injection valve	Column	C/D	50 µm	G1375-87304	83
f	Injection valve	Waste	C/-	100 µm	G1375-87307	50
g	Column	Detector	D/E	50 µm	G1315-68703	83
h	Detector	Waste	E/-	75 µm	G1315-68708	83
µ-switching valve	Column		C/D	50 µm	G1375-87309	67

## GENERAL SUPPLIES

### Capillaries for Nano LC System

Description	Part No.	Price (\$)
Fused silica/PEEK capillary, 25 µm, 10cm	G1375-87320	67
Fused silica/PEEK capillary, 25 µm, 22cm	G1375-87321	83
Fused silica/PEEK capillary, 25µm, 35cm	G1375-87322	83
Fused silica/PEEK capillary, 25µm, 55cm	G1375-87323	83
Fused silica/PEEK capillary, 25µm, 70cm	G1375-87324	100
Fused silica/PEEK capillary, 50µm, 10cm	G1375-87325	67
Fused silica/PEEK capillary, 75µm, 65cm	G1375-87327	100
Nanoflow LC start up kit	G2228-68700	2205

### Standard Vials

Description	Unit	Part No.	Price (\$)
Crimp top vial, 2ml Clear	100/pk	5181-3375	14
Crimp top vial, 2ml Clear	1000/pk	5183-4491	117
Crimp top vial, 2ml Clear, silanized	1000/pk	5183-4494	29
Crimp top vial, 2ml Clear, write-on spot	100/pk	5182-0543	16
Crimp top vial, 2ml Clear, write-on spot	1000/pk	5183-4492	132
Crimp top vial, 2ml Clear, write-on spot, silanized	100/pk	5183-4495	30
Crimp top vial, 2ml Amber, write-on spot	100/pk	5181-3376	17
Crimp top vial, 2ml Amber, write-on spot	1000/pk	5183-4493	135
Crimp top vial, 2ml Amber, write-on spot, silanized	100/pk	5183-4496	34
Crimp/snap top vial, 1ml Polypropylene	100/pk	5182-0567	18
Crimp/snap top vial, 0.3ml Polypropylene	1000/pk	9301-0978	232
Crimp/snap top vial, 2ml Clear	100/pk	5182-0544	16
Crimp/snap top vial, 2ml Clear	1000/pk	5183-4504	141
Crimp/snap top vial, 2ml Clear, silanized	100/pk	5183-4507	31
Crimp/snap top vial, 2ml Clear, write-on spot	100/pk	5182-0546	17
Crimp/snap top vial, 2ml Clear, write-on spot	1000/pk	5183-4505	150
Crimp/snap top vial, 2ml Clear, write-on spot, silanized	100/pk	5183-4508	34
Crimp/snap top vial, 2ml Amber, write-on spot	100/pk	5182-0545	19
Crimp/snap top vial, 2ml Amber, write-on spot	1000/pk	5183-4506	167
Crimp/snap top vial, 2ml Amber, write-on spot, silanized	100/pk	5183-4509	34
Screw top vial, 2ml Clear	100/pk	5182-0714	18
Screw top vial, 2ml Clear	1000/pk	5183-2067	146
Screw top vial, 2ml Clear, silanized	100/pk	5183-2070	31
Screw top vial, 2ml Clear, write-on spot	100/pk	5182-0715	19
Screw top vial, 2ml Clear, write-on spot	1000/pk	5183-2068	157
Screw top vial, 2ml Clear, write-on spot, silanized	100/pk	5183-2071	32
Screw top vial, 2ml Amber, write-on spot	100/pk	5182-0716	20
Screw top vial, 2ml Amber, write-on spot	1000/pk	5183-2069	166
Screw top vial, 2ml Amber, write-on spot, silanized	100/pk	5183-2072	33

**6 ml Vials and Caps for 1100 Series**

Description	Unit	Part No.	Price (\$)
Clear crimp vial, 20mm cap size	100/pk	9301-1419	25
Crimp caps, PTFE/silicone septa, 20mm	100/pk	9301-1425	40
Clear screw vial, 16mm cap size	100/pk	9301-1377	25
Clear screw extreme high recovery vials, 16mm cap size	30/pk	5188-2757	91
Screw caps, 16mm	100/pk	9301-1379	19
PTFE/silicone septa, 16mm	100/pk	9301-1378	34
PTFE/silicone septa, pre-slit, 16mm	100/pk	5188-2758	32

**Microvials**

Description	Unit	Part No.	Price (\$)
Crimp top microvials with fixed inserts	100/pk	9301-1388	80
Microvial inserts	500/pk	9301-1387	108

**Caps**

Description	Unit	Part No.	Price (\$)
Aluminum crimp caps, clear PTFE/red rubber septa	100/pk	5181-1210	13
Aluminum crimp caps, clear PTFE/red rubber septa	1000/pk	5183-4498	107
Aluminum crimp caps, blue, clear PTFE/red rubber septa	100/pk	5181-1215	14
Aluminum crimp caps, green, clear PTFE/red rubber septa	100/pk	5181-1216	14
Aluminum crimp caps, red, clear PTFE/red rubber septa	100/pk	5181-1217	14
Polypropylene screw caps, blue, PTFE/red rubber septa	100/pk	5182-0717	19
Polypropylene screw caps, green, PTFE/red rubber septa	100/pk	5182-0718	19
Polypropylene screw caps, red, PTFE/red rubber septa	100/pk	5182-0719	19
Polypropylene snap caps, clear PTFE/red rubber septa	100/pk	5182-0550	21
Polypropylene snap caps, blue, clear PTFE/red rubber septa	100/pk	5182-3458	19
Polypropylene snap caps, green, clear PTFE/red rubber septa	100/pk	5182-3457	18
Polypropylene snap caps, red, clear PTFE/red rubber septa	100/pk	5182-3459	19
Polypropylene screw caps, blue, PTFE/silicone septa	100/pk	5182-0720	27
Polypropylene screw caps, green, PTFE/silicone septa	100/pk	5182-0721	27
Polypropylene screw caps, red, PTFE/silicone septa	100/pk	5182-0722	27

## Vial Kits



Description	Part No.	Price (\$)
2 ml vial kit includes 100 vials, 100 crimp caps, 1 (11 mm) crimper	01078-68705	229
Clear crimp top vials, silver aluminum crimp caps, PTFE/red rubber septa in 6 drawer storage box (500/pk)	5181-3400	119
Amber crimp top vials with write-on spot, silver aluminum crimp caps, PTFE/red rubber septa in 6 drawer storage box (500/pk)	5181-8801	145

## Electronic Crimper For 2 mL crimp top autosampler vials



Agilent's electronic crimper allows you to crimp vials without removing them from their common autosampler trays. It also lets you crimp hundreds of vials with a single battery charge. Features include:

- An electric motor for reproducible crimps.
- Hand-held, push-button operation.
- Electronic crimp force adjustment.
- A rechargeable VersaPak Gold Nickel Metal Hydride battery from Black & Decker.
- Ergonomic design to minimize wrist fatigue.

Description	Part No.	Price (\$)
Electronic Crimper for 2ml, 12x32mm crimp vials and 11mm crimp caps, with Black & Decker VersaPak gold battery and charger	5183-4763	510
Electronic Decapper for 2ml, 12x32mm crimp vials and 11mm crimp caps, with Black & Decker VersaPak Gold battery and charger	5184-3567	510
Electronic Crimper for 20mm crimp vials and 20mm aluminum crimp caps, with Black & Decker VersaPak Gold battery and charger	5184-3572	510
Electronic Decapper for 20mm crimp vials and 20mm aluminum crimp caps, with Black & Decker VersaPak Gold battery and charger	5184-3573	510
Black and Decker VersaPak Gold NiMH rechargeable battery	5183-4799	36

## Services and Support

Every Agilent LC and LC/MS system is backed by our nearly 40 years of experience with instrument design, lab operations, business processes, and regulatory requirements.

We stand behind our products with ...

- Immediate technical assistance by phone or online.
- Prompt onsite service from Agilent-certified Engineers.
- A variety of service options, including maintenance, repair, compliance, and consultation.
- Industry-leading training courses to help increase your lab's overall knowledge base.

Our professionals are standing by to help you solve problems and optimize your resources. So you can spend more time running samples, developing methods and meeting production deadlines – and less time arranging for instrument services.



*"Our customers know they can rely on Agilent's expertise and resources to keep their instruments running at top performance."*

**Yukiko Sameshima**  
**Customer Engineer**

**A Total Commitment to Your Lab for One Fixed Cost**

Agilent service agreements operate under a yearly fixed cost, which includes preventative maintenance, compliance, telephone support, repairs, parts, and labor. No matter how many service visits or replacement parts you need, this fixed cost covers it all – at no additional charge

**The Unmatched Expertise of Fully Trained Engineers**

You can rest assured that the engineer who arrives at your site will perform the requested service with optimum skill. That's because Agilent engineers ...

- Are experts in instrument operation, maintenance, compliance, and repair.
- Continually update their training and qualifications.
- Use only Agilent factory-approved replacement parts, columns, and supplies to ensure peak instrument reliability.
- Carry calibrated, traceable tools and testing equipment, as well as Agilent hardware and software qualification protocols.

What's more, most Agilent engineers are part of the Agilent product development team. So you can be certain that ease of repair, maintenance, and compliance are built into your GC and GC/MS systems right from the start.

**The Flexibility to Select the Solution That's Right for You**

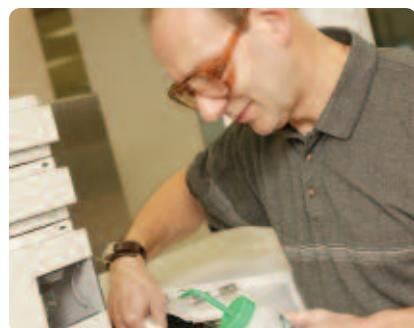
Our team will work with you to help your laboratory achieve ...

• Maximum uptime	• Verified system performance
• High productivity	• The skills and knowledge you need for efficient operation and maintenance
• Total compliance	• Consistent, in-depth documentation
• Extended instrument life	• Reduced administrative burdens
• Fast problem resolution	

If you choose, you can also consolidate instrument maintenance and repair services into multi-year agreements for administrative ease and greater cost savings.

Agilent Services	Features	Advantages to You
<b>Telephone Service</b>	<ul style="list-style-type: none"> <li>Telephone access to skilled Agilent service professionals</li> <li>Available parts option</li> </ul>	<ul style="list-style-type: none"> <li>Fast identification and resolution of hardware problems</li> <li>Low cost</li> </ul>
<b>Software Service</b>	<ul style="list-style-type: none"> <li>Telephone access to trained technical professionals</li> <li>Enhancements to the original application software purchase</li> <li>Software bulletins that identify discovered defects and recommend workarounds</li> </ul>	<ul style="list-style-type: none"> <li>Fast identification and resolution of software problems</li> <li>A fixed annual cost for software upgrades makes budget management more predictable</li> <li>A single cost-effective source for telephone support and software updates</li> <li>A convenient way to keep up with the latest software enhancements</li> </ul>
<b>Onsite Instrument Repair</b> For selected Agilent instruments	<ul style="list-style-type: none"> <li>Hardware telephone support with access to skilled, factory-trained Agilent service professionals</li> <li>Travel expenses and labor</li> <li>Optional coverage for consumables used during repair</li> </ul>	<ul style="list-style-type: none"> <li>A fixed annual cost for parts makes budget management more predictable</li> <li>You can choose the response method that fits your business needs and budget</li> </ul>
<b>Offsite Instrument Repair</b> For selected Agilent instruments	<ul style="list-style-type: none"> <li>Option 1: Replacement with an identical instrument (your fastest choice)</li> <li>Option 2: Return to Agilent for repair</li> </ul>	<ul style="list-style-type: none"> <li>Less expensive than onsite repair.</li> <li>Fast and easy.</li> <li>Includes extensive diagnostics and testing that are not feasible with onsite maintenance or repair.</li> </ul>
<b>Preventative Maintenance</b>	<ul style="list-style-type: none"> <li>Expert cleaning, adjustment, lubrication, and inspection of your instrument</li> <li>Travel expenses and labor</li> <li>Coverage for consumables used</li> </ul>	<ul style="list-style-type: none"> <li>Maximum uptime</li> <li>Extended instrument life</li> <li>Confidence in the integrity of your measurements</li> </ul>
<b>Installation Qualification (IQ)</b>	<ul style="list-style-type: none"> <li>Qualification and documentation of shipment completeness</li> <li>Comprehensive system and application software verification tests</li> <li>Delivered by professionals with training certification</li> </ul>	<ul style="list-style-type: none"> <li>Supplies the evidence you need to satisfy regulatory agencies</li> <li>Helps fulfill the master validation plan – and change-control SOP requirements – for the IQ phase</li> </ul>

Agilent Services	Features	Advantages to You
<b>Operational Qualification/Performance Verification (OQ/PV)</b>	<ul style="list-style-type: none"> <li>Verification and documentation of an instrument's ability to meet specified criteria</li> <li>Procedures and documentation that fit the requirements of GLP, ISO 9000, and other regulatory agencies</li> <li>Full automation to increase the qualification scope without excess time requirements</li> <li>Measuring equipment that is traceable to national and international standards.</li> </ul>	<ul style="list-style-type: none"> <li>Supplies the evidence you need to satisfy regulatory agencies.</li> <li>No need to write your own SOPs to qualify Agilent instruments – or to train your staff.</li> <li>Consistent, traceable results among all your laboratories – and improved method transfer.</li> <li>Confidence in the integrity of your measurements, with traceable, documented chains from sample introduction to reporting.</li> <li>Less risk of financial loss due to noncompliance.</li> <li>Meaningful, relevant, and understandable system tests.</li> </ul>
<b>Requalification (RQ) After Repair</b>	<ul style="list-style-type: none"> <li>Verification that a system is performing at operation specifications after repair</li> <li>Complete system operation testing</li> </ul> <p><i>Note: only a subset of the Operational Qualification test is performed, based on the type and extent of the repair</i></p>	<ul style="list-style-type: none"> <li>Minimal system downtime after completion of instrument repair</li> <li>Efficient system requalification by performing the appropriate tests based on the components repaired</li> <li>Assurance that all instrument subsystems are performing within specifications</li> <li>All procedures and documentation meet regulatory agency requirements</li> </ul>
	<ul style="list-style-type: none"> <li>A comprehensive test of the repaired module using established conditions and known sample characteristics to ensure the basic accuracy and precision of your module</li> <li>Measuring equipment is traceable to national and international standards</li> </ul>	



Agilent Services	Features	Advantages to You
<b>Network Qualification</b>	<ul style="list-style-type: none"> <li>Network definition and performance testing using established Agilent Design, Installation Qualification, and Operational Qualification protocols</li> <li>Documentation of the definition, integrity, supportability, and health of high-risk network segments.</li> <li>Completed protocols, created using hardware and software network testing tools. Protocols include: <ul style="list-style-type: none"> <li>- A physical and logical inventory</li> <li>- A graphical network topology map</li> <li>- A snapshot of network health, as installed</li> </ul> </li> <li>Network Operational Qualification testing, which monitors the network over time, and evaluates its operation over a controlled range of traffic conditions. We'll also provide the following reports: <ul style="list-style-type: none"> <li>- Long Duration Network Characterization, which analyzes each function in its operating environment.</li> <li>- Performance Predictability Analysis, which documents reserve capacity and stability over a range of operating demands.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Significant time savings</li> <li>Increased uptime – issues that might impact application performance are quickly identified and resolved</li> <li>Improved consistency – network qualification protocols are developed according to a quality lifecycle, and are maintained under version and revision control</li> <li>Increased control – Agilent will verify known elements and identify unknown network contingency states that may impact application performance</li> <li>Reduced regulatory exposure – audit-ready documentation establishes evidence of network system control</li> </ul>
<b>Mass Spectrometer Ion Source Cleaning</b> For selected Agilent instruments	<ul style="list-style-type: none"> <li>Onsite disassembling</li> <li>Cleaning</li> <li>Reassembling</li> <li>Testing</li> </ul>	<ul style="list-style-type: none"> <li>Your staff can devote more time to chemistry, not instrument maintenance</li> <li>Efficient cleaning with minimal downtime</li> </ul>
<b>Software Backup</b>	<ul style="list-style-type: none"> <li>Telephone or onsite factory support to facilitate restoration</li> <li>Captures the unique system settings for all software components needed to reconstruct your system including:</li> </ul>	<ul style="list-style-type: none"> <li>Fast and easy – you simply insert a disk ... reboot ... and you'll be back in operation in as little as two hours. Normally, you would have to reload and reconfigure your software – a process that can take days.</li> <li>A complete solution – the initial configuration backup includes:</li> </ul>

## Education & Training Services



Highly trained lab professionals can boost your productivity, minimize errors and reruns, and expand your chromatography capabilities. And that's why Agilent offers several training options that cover everything from troubleshooting and maintenance to the most advanced operational techniques.

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**Classroom Training**

Agilent's training courses for liquid chromatography and mass spectrometry help new and experienced lab professionals learn proper and efficient ways to use analytical instruments and software. These ISO-registered courses also target those who want to broaden or sharpen their troubleshooting, maintenance, and system operation skills.

Contact Agilent today for more information about our training and services. Or visit [www.agilent.com/chem](http://www.agilent.com/chem) and select "Education."

Course Title	Course No.	No. of Days	Description
Practical High Performance Liquid Chromatography	H5930A	1	Introduces the basics of liquid chromatography in a lecture format
Techniques of High Performance Liquid Chromatography	H1186A	4	Presents the fundamental concepts of liquid chromatography in a laboratory and lecture format
Introduction to Liquid Chromatography and the HPLC ChemStation	H5929A	4	Explains how to operate Agilent 1100 Series Liquid Chromatographs using HPLC ChemStation software
Agilent 1100 Series HPLC (3D) ChemStation Operation	H4033A	4	Provides hands-on laboratory exercises on the operation and maintenance of the Agilent 1100 Series Liquid Chromatograph equipped with a Diode Array controlled by the HPLC (3D) ChemStation
Agilent 1100 Series HPLC Troubleshooting and Maintenance	H8969A	2	Introduces maintenance and troubleshooting for the Agilent 1100 series modules
Agilent 1100 Series HPLC Routine Maintenance	H4058A	1	Introduces troubleshooting and maintenance of the isocratic, binary, and quaternary pumping systems. Also covers the vacuum degasser, autoinjector, variable wavelength detector and diode array detector.
Agilent 1100 Series HPLC (2D) Data Analysis and Reporting	H5928A	2	Teaches use of Agilent HPLC (2D) ChemStation software for data analysis and reporting
Agilent 1100 Series HPLC (3D) Data Analysis and Reporting	H4039A	3	Teaches use of Agilent HPLC (3D) ChemStation software for data analysis and reporting

## Support



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For a wealth of knowledge, tips, and insights, go to [www.agilent.com/chem](http://www.agilent.com/chem). You'll find:

- **Frequently Asked Questions** about Agilent instruments and supplies.
- **Interactive Troubleshooter** A step-by-step approach to help you solve common problems.
- **Find a Part** Includes parts information, pricing, and availability, plus an illustrated parts breakdown.

### • Software Downloads and Utilities

Feature patches and status bulletins, tools and utilities, firmware, and revision tables.

- **How-to Videos** Show you how to perform common installation and maintenance procedures for Agilent products.

- **Chromatogram Library** A searchable collection of GC, LC, and CE chromatograms for nearly a thousand chemical compounds.

- **Instrument and Software Demos** Such as product videos, 3D animations and interactive software demos.

### Technical Support Consultation

Have a technical LC column, method, or troubleshooting question? Agilent's technical LC and LC/MS experts are available to answer your questions by phone, fax or e-mail for free. With years of experience in running samples, developing methods and troubleshooting LC systems, our chemists are promptly able to help you consistently achieve excellent performance and high productivity in your lab.

For LC Technical Support go to [www.agilent.com/chem/techsupport](http://www.agilent.com/chem/techsupport) and click on "Interactive Troubleshooter."

# 1100 Series LC System Recommended Maintenance Schedule

## Pumps

ITEM	TYPICAL SCHEDULE	ACTIONS/COMMENTS
PTFE frits in purge valve	Every month	Before re-installation of the purge valve, always check the gold seal and replace if deformed.
Solvent inlet filter	Every 6 months	Never use the system without a filter installed.
Piston seals, outlet gold seal, plastic cap, wash seal, gasket wash seal	Every 12 months	When piston seals are exchanged, check the surface of the piston for scratches and deposits. Never re-install a used piston seal.
Piston, cartridge active inlet valve, outlet ball valve	Every 24 months	Pistons can be cleaned with alcohol or toothpaste. After exchanging the active inlet valve cartridge, pump several mL until the system is stable.

## Autosampler

ITEM	TYPICAL SCHEDULE	ACTIONS/COMMENTS
Guard column	Every 100-500 injections	Change the guard after 25-50 injections for dirty samples, 100-250 injections for most samples, and 500 injections for very clean samples.
Piston seal, isolation seal, stator face	Every 24 months	

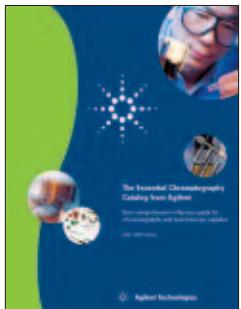
## Column

ITEM	TYPICAL SCHEDULE	ACTIONS/COMMENTS
Needle and needle seat, rotor seal	Every 12 months	Make sure you use rotor seals of the correct material depending on the operating pH.
Column inlet fittings	Every 5-10 column changes	PEEK fittings make changing inlet fittings fast and easy. SS fittings are reliable and can be used at higher pressure.

## Detectors

ITEM	TYPICAL SCHEDULE	ACTIONS/COMMENTS
DAD and MWD Detectors	Exchange standard lamps after 1000 hours. Exchange long-life lamps after 2000 hours.	A noisy baseline may indicate it is time to change the lamp. Low light intensity can be caused by a dirty flow cell.
Flow cell	Check cleanliness every 6 months	Low light intensity can be caused by a dirty flow cell.
VWD Detectors	Exchange lamp after 1000 hours	Low light intensity can be caused by a dirty flow cell.
Flow cell	Check cleanliness every 6 months	

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For detailed information about supplies from Agilent, please contact your local Agilent sales representative, or your authorized distributor, or visit us online.

Ask about Agilent's other valuable resources:

- *Agilent ZORBAX Column Selection Guide for HPLC*
- *Maintaining your Agilent GC and GC/MS Systems*
- *Essential Chromatography Catalog*
- *Online Library and Tech Support*

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